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### **US Navy Ships Food Service Divisions: Modernizing Inventory Management**

**31 May 2010**

**by**

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## Abstract

The Navy's current inventory management procedures for receipt, inventory, stowage, and issue of provisions onboard ships have remained relatively unchanged for decades. Culinary Specialists are utilizing an antiquated and unreliable inventory management program (the Food Management System—FSM) developed in the 1990s, relying on hand-written receipts, and inventory and issue procedures to manage provisions across the Fleet. As a result of current practices, ships are experiencing an unusually high rate of inspection failures and poor inventory validities. Applying a strategic supply-chain management approach, we will describe current procedures, from receipt to issue of provisions, including collecting and analyzing qualitative and quantitative data. We will offer conclusions and recommendations on ways to substantially improve the overall process (e.g., improve inventory validities, reduce man-hours and improve the quality of life for Culinary Specialists).

**Keywords:** Inventory management, records keeper, stores onload process.



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# Table of Contents

<b>I.</b>	<b>Introduction .....</b>	<b>1</b>
<b>II.</b>	<b>Literature/Methodology .....</b>	<b>5</b>
A.	Literature .....	5
B.	Methodology .....	6
C.	Naval Supply Systems Command Players .....	6
D.	Prime Vendor (US Foods) .....	7
E.	Ships and Assigned Personnel.....	7
<b>III.</b>	<b>Inventory Records Keeping.....</b>	<b>9</b>
A.	Introduction to Records Keeping .....	9
B.	Records-Keeping Procedures and documents .....	9
C.	Food Service Management .....	12
<b>IV.</b>	<b>Receipt Process .....</b>	<b>15</b>
A.	Introduction.....	15
B.	NAVSUP Inspection/Inventory Policy Guidance .....	17
C.	Order Prepared For Delivery .....	18
D.	Inventory and Inspect .....	18
E.	Food Loaded .....	21
F.	Calculating Costs.....	24
<b>V.</b>	<b>Ordering Process .....</b>	<b>31</b>
A.	Current Ordering Process.....	31
B.	Order Development .....	33
C.	LSC Creates Order.....	34
D.	Confirmation of Order .....	36



E.	Finalization of Order .....	36
<b>VI.</b>	<b>Order Process Recommendation .....</b>	<b>39</b>
A.	Recommendations for The Order Process .....	39
B.	Records Keeper Ashore .....	39
C.	Technology Support .....	49
D.	Vendor Managed Inventory .....	50
E.	Conclusion.....	52
<b>VII.</b>	<b>Recommendations for the Receipt Process .....</b>	<b>55</b>
A.	Introduction to Recommendations .....	55
B.	Recommendation #1 .....	55
C.	Recommendation #2: Spot Checks .....	62
D.	Conclusion.....	64
	<b>List of References.....</b>	<b>65</b>



## List of Acronyms and Abbreviations

Army VET	US Army Veterinarian Inspection Team
ASDOF	Afloat Supply Department of the Future
ATG	Afloat Training Group
CG	Guided Missile Cruiser
CSs	Culinary Specialists
DD	Guided Missile Destroyer
FFG	Guided Missile Frigate
FFV	Fresh Fruits and Vegetables
FIC	Food Item Code
FISC	Fleet Industrial Support Centers
FSM	Food Management System
FSO	Food Service Officer
IDIQ	Indefinite Delivery, Indefinite Quantity
INMARSAT	International Maritime Satellite
JOD	Jack of the Dust
LCS	Leading Culinary Specialist
LCS	Littoral Combat Ship
LSC	Logistics Support Center
LSR	Logistic Support Representative
MSC	Military Sealift Command
NAVSUP	Naval Supply Systems Command
NFMT	Navy Food Management Team



PAPADET	Pay and Personnel Detachment
PV	Prime Vendor
SKU	Stock-keeping Unit
SMC	Supply Management Certification
SMEs	Subject-matter Experts
SPV	Subsistence Prime Vendor
SUPPO	Supply Officer
TOC	Total Ownership Costs



## Terms and Definitions

**Army Veterinarian (Army VET)/Designated Medical Representative**—The designated medical representative performs fitness-for-human-consumption inspections of subsistence at receipt and exercises constant surveillance concerning sanitary aspects of food preparation and service. The medical representative inspects food items when any doubt exists concerning the food's fitness for human consumption. Items found unfit for use or possibly harmful to health will require reports as described in the *Naval Supply Systems Command Instruction P-486*, paragraphs 5300 and 5301.

**ATG**—Afloat Training Group

**Break-back**—The term *break-back* refers to those items that are removed from the storeroom by the Bulk Storeroom Custodian for anticipated use during the meal preparation, but are ultimately not required. As a result, an additional entry is made by the Records Keeper in the FOOD SERVICE MANAGEMENT system, effectively reversing the initial break-out.

**Break-out**—*Break-out* is a term used on board Navy ships to refer to the removal of inventory from storerooms for meal preparation. The ship is not officially charged for that item until it has been removed from the inventory, and appropriate break-out annotations are entered into the FOOD SERVICE MANAGEMENT system.

**Bulk Storeroom Custodian or “Jack of the Dust” (JOD)**—The bulk storeroom custodian must be designated in writing by the Food Service Officer (see Appendix B for example). The bulk storeroom custodian's duties include the following:

- a. Taking responsibility for all bulk subsistence storerooms in which dry, chilled, and frozen provisions are maintained, as well as for the subsistence-issue room, if one is used;





- b. Maintaining security and inventory accuracy of all accountable food and preserve its condition until issue or proper expenditure,
- c. Reporting any compromise to accountability immediately to the Food Service Officer, and
- d. Reporting any potential loss of food stock as a result of storeroom conditions, such as flooding, fire or high temperature.

**Food Service Officer (FSO)**—The FSO is the individual accountable for the daily operations of the general mess and is financially accountable for all provisions in the inventory. The FSO is under the authority of the Supply Officer for the proper and efficient operation of the general mess and is responsible for ensuring that its organization and operation follow applicable portions of Navy Regulations, General Orders, and Naval Supply Systems Command, Support Services Directorate, Food Service Division (Naval Supply Systems Command, Chapter 51), Fleet, Force, Type, and station commander directives.

**Leading Culinary Specialist**—(LCS) The Leading Culinary Specialist is the senior enlisted Petty Officer assigned to the foodservice division and is responsible to the Food Service Officer for the proper functioning of the division. The Leading Culinary Specialist will be directly responsible for ensuring a high level of cleanliness in the general mess and for the proper sanitary preparation of rations in sufficient quantity, while remaining within prescribed monetary food allowances. Whenever possible, the duties of the Leading Culinary Specialist will be performed by military personnel. If military personnel are not available, the duties may be assigned to Government or contractor employees, subject to Type Commander approval.

**Naval Supply Systems Command (NAVSUP)**—The Naval Supply Systems Command provides overall policy guidance to all food service operations Navy-wide.

***Naval Supply Systems Command Publication 486***—(NAVSUP P-486) is the publication provided by the Naval Supply Systems Command to establish policy for the operation and management of Navy general messes afloat and ashore. The procedures outlined in this publication are designed to assist food service personnel



in the proper performance of their assigned duties and to aid them in understanding and fulfilling the responsibilities of their individual tasks associated with general mess operations.

**Navy Food Management Team (NFMT)**—is a team of experienced Culinary Specialists established by FISC to provide the following assistance in the form of on-the-job training in the following areas:

- Proper food service techniques, including management, production, service of food, sanitation, training, and accounting;
- Management awareness in progressive cookery, proper serving techniques, food service safety precautions, operating procedures, fire prevention, sanitation and personal hygiene;
- Use of facilities, equipment, personnel and other food service resources;
- Manual and automated food service records, financial returns, and organization and operating manuals;
- DoD, Navy, and command food service policy and procedures;
- Food service education programs;
- Item pricing procedures; and
- Recording observations for follow-up action by the command.

**Prime Vendor (PV)**—The Prime Vendor is the contracted civilian company responsible for providing food to the ships.

**Records Keeper**—The Records Keeper is responsible for all inventory records onboard US ships. They report directly to the Leading Culinary Specialist on all matters related to the financial management of the general mess and on issues of accountability. Questionable circumstances are referred to the Food Service Officer for resolution.

**Stevedore**—This term refers to FISC-contracted civilian support provided to afloat units to load stores, a task previously performed by the ship's crew.



**Subsistence Prime Vendor (SPV) Representative**—The SPV Representative is a division of the LSC responsible for assisting the ships in the ordering of all provisions from the Prime Vendor. They are responsible for reviewing all orders, and they act as the “middleman” between the ship and the Prime Vendor.

**Supply Officer (SUPPO)**—The Supply Officer is assigned to duty as the head of the supply department and will usually be an officer of the Supply Corps. The Supply Officer performs both supply and food service duties unless the Commanding Officer designates, in writing, an assistant to the Supply Officer as the Food Service Officer. The Supply Officer’s duties and responsibilities include general supervision of food service operations; issuing instructions that set food service safety, precautions, sanitary regulations, and equipment operating instructions, and Navy Working Capital Fund accounting at activities carrying food in the Navy Working Capital Account.

**SYSCO**—Bulk food distributor. SYSCO is the company in Norfolk, VA, that currently holds the PV contract for all Norfolk food service departments both afloat and ashore.

**US Food Services**—Bulk food distributor. US Food currently holds the contract to provide all food items to Navy military units (afloat and ashore) in San Diego, CA.



# Executive Summary

The Navy's current inventory management procedures for receipt, inventory, stowage, and issue of provisions onboard ships have remained relatively unchanged for decades. Culinary Specialists are utilizing an antiquated and unreliable inventory management program (the Food Management System—FSM) developed in the 1990s, relying on hand-written receipts, and inventory and issue procedures to manage provisions across the Fleet. As a result of current practices, ships are experiencing an unusually high rate of inspection failures, and poor inventory validities.

After conducting field research in the area of inventory management for food service divisions onboard Naval units in San Diego, and applying a strategic supply-chain management approach to current procedures from receipt to issue of provisions, we identified three specific ways in which significant efficiencies can be gained: maintain records-keeping functions afloat in order to simplify the ordering process, move ordering activities ashore, and change the inspection procedure as part of the receipt procedures. As a result of this study, the authors of this thesis found opportunities to gain efficiencies in both the ordering and receipt processes, to reduce the workload on our overburdened Culinary Specialists afloat, and to improve the overall quality of life for all sailors. We suggest the following two recommendations as supported in the main body of this report:

- 1. Receipt Process—Included in the current receipt process (and the main focus of our study in this area) is the requirement for each ship, upon receipt of food deliveries from the Prime Vendor, to perform a 100% inventory of all material prior to acceptance and stowage. We discovered that as a result of this requirement considerable time and money is being wasted while ship's crew members, as well as contracted working parties assigned to conduct the on-load of these provisions, stand idle as this inventory and quality-control check is being performed. During our research, we monitored the receipt process of five smaller ships and discovered that for each delivery, approximately one hour elapsed between the time when the contracted working party arrived on the pier and the actual work commenced,



resulting in a waste of almost \$500 per ship, per delivery. Additionally, during this time, there were in excess of four ships' crew members per unit who were also idle, resulting in a loss of time in which they could have been performing their primary duties. In order to rectify this inefficiency, we have identified two potential recommendations, detailed in this report. Our first recommendation includes providing a government representative to conduct this 100% inventory count at the Prime Vendor's warehouse prior to delivery. This recommendation precludes the requirement for the pier-side inventory, and as such the loading process for food deliveries could begin immediately. If this recommendation proves impractical for contractual reasons, our second recommendation would include doing away with the 100% inventory requirement, and instead conducting only a 10% spot check of the delivery as it is being loaded on the ship. In addition to the 10% random spot-check, ship's crew would be required to conduct 100% inventory of all high dollar items as well as of critical food staples, as determined by either the Naval Supply System Command or by each unit's standard operating procedures.

- 2. Ordering Process—Our recommendation to improve the ordering and records keeping process entails moving both these processes ashore immediately. These two processes are difficult and time-consuming tasks and, as such, burden our Culinary Specialists afloat, reducing their availability to perform their primary mission—that of feeding the crews of those ships. By moving the current records-keeping functions and order development ashore, we will be freeing up those Culinary Specialists to focus on feeding the crews and thus improve the quality of life for our sailors. We contend that as ships underway enjoy improved communication connectivity—as a result of technology improvements made over the past 20 years and because of the predictability of the Navy's 21-day Menu Cycle—it is now feasible and advantageous to move these records-keeping functions ashore. We challenge the Naval Supply System Command's decision to delay this move while it seeks to develop an IT solution to replace the antiquated Food Service Management (FSM) system currently being utilized onboard ships across the fleet. We recommend that the Naval Supply Systems Command make the decision to immediately move the current FSM system to a shore detachment, along with a majority of inventory management and initial-order development processes. As we will discuss, such a move would reduce the administrative burden, improve the current ordering process, provide additional layers for inventory management, and provide decision makers with a single point of contact for real-time information on the food inventories of all ships under their command.



# I. Introduction

The Naval Supply Systems Command has recognized that personnel are the single most important resource in food service operations, and as such, it requires that we as leaders are responsible for providing effective and efficient management of this important resource. For food service operations Navy-wide, manpower costs are arguably the single greatest expense. With these costs at an all-time high, the Navy must exercise considerable control coupled with continuous analysis of processes and outcomes to keep these costs manageable. Shipboard food service personnel are expected to maintain quality Navy food service, provide service to mess patrons, and perform additional assigned duties that are inherently unique to shipboard life. These collateral duties include, but are not limited to, training, professional development, watch standing, etc. These numerous collateral duties place an additional workload on our already overburdened Culinary Specialists (CSs). With limited manpower resources, we must continuously seek ways to provide our CSs with the tools necessary to perform these additional tasks, while at the same time providing the highest level of customer service to the crew. This requires that we continue to ensure that all aspects of food service operations afloat are as efficiently organized as possible. We must provide our Culinary Specialists with a work schedule geared to the ability and workload of all personnel assigned.

Faced with personnel shortages in food service divisions across the fleet and with the current antiquated inventory procedures onboard Navy ships, there is an opportunity for the Navy to explore how resource-management changes could improve food service inventories. Poor management of provision inventories is one of the primary reasons that Supply Corps Officers, from Department Heads to Food Service Officers, are relieved of duty. Officers can be relieved of duty as a result of actions performed by an inexperienced junior-enlisted sailor who is incorrectly maintaining food service records. All associated personnel onboard ships, from the Department Head down to the junior culinary specialist, dedicate substantial hours to



the ordering, receipt, stowage, inventory, and issue of provisions. While these man-hours are often considered, in business terms, a sunk cost, they also comprise opportunity costs. The hours dedicated to receipt, inventory, spot checks, break-out, and break-backs can interrupt sailors from performing the primary duties of the Food Service Division, (e.g., feeding the crew). In the end, the hours devoted to this cumbersome process can adversely impact the morale of those in the food service department and, ultimately, the entire crew. It is common knowledge that food quality on an underway ship greatly impacts crew morale.

The Commander, Naval Supply Systems Command, Rear Admiral M. J. Lyden, provided his vision and guidance to the Supply Corps community for the coming year. In this guidance, three of his five strategic focus areas for Fiscal Year 2010 were Logistic Support, Alignment, and Our People. In each of these three areas, he stressed the need to make improvements that will positively affect all three, while at the same time gaining efficiencies throughout the Supply Corps as a whole. Admiral Lyden also stated, “our watchword is interdependence, and we are committed to creating and maximizing alignment between Joint partners, Fleet customers, warfare enterprises and other key stakeholders. Our success depends on the dedication, professionalism and skills of our entire workforce—military, civilian, and contractor” (Lyden, 2010, pg 1). He goes on further to add,

Clearly, Naval Supply Systems Command mission encompasses a broad and diverse set of responsibilities. Our products and services help maintain warfighter readiness and improve the Quality of Life of our Sailors and their families. I challenge our leaders and workforce to fully apply the philosophy of continuous process improvement to increase our effectiveness. (Lyden, 2010, pg 2)

With increased budget challenges and ever-growing operational commitments facing the United States Navy, it is imperative that we continuously strive for ways to reduce costs while improving efficiencies. In doing so, we must focus our efforts to streamline current operations and incorporate best business practices to stretch an already limited budget. One of the focuses of this thesis is to review current business practices with regard to certain aspects of the Navy’s food service operation afloat,





and to look for ways to gain both efficiencies and effectiveness while reducing Total Ownership Costs (TOC). In doing so, we will be focusing our attention on three specific areas of food service operations: receipt processing, ordering, and inventory management.

Based on our personal experiences as department heads afloat, we have intimate knowledge of many of the food service policies and procedures. As a result, we have noticed that many of these policies have led to inefficiencies and created additional work requirements for our culinary specialists afloat, resulting in wasted time and money for the Navy. While developing the topic for this thesis, we noticed there are several areas that require attention and where commercial business practices could assist us in gaining efficiencies in those areas. As we mentioned earlier, we will be focusing on three particular areas of food service afloat that we contend are areas that, with little capital investment, can be improved in the short term. Receipt processing, ordering, and inventory management are cumbersome at best. Our Culinary Specialists are currently performing their duties with regard to records keeping by using antiquated software, mainly that of the Food Service Management afloat. These functions are inherently tasking and require a full-time CS to perform, both in port and underway.

In addition to drawing from the *Commander's Guidance*, we will apply many of the concepts introduced by Naval Supply Systems Command Chapter 21 initiative, which began in 1998. As a result of the initiative, the Afloat Supply Department of the Future (ASDOF) program was chartered and charged with developing new policies and procedures to improve the quality of life for our sailors, both afloat and ashore, reducing sea-shore rotations for our culinary specialists and transferring ashore those functions not specifically required to be performed afloat. As a result of the ASDOF initiative, Naval Supply Systems Command has made great strides improving several key aspects of the food service operation afloat; however, many of their initial recommendations and proposals have yet to be instituted. Our failure to leverage many of the new policies and procedures instituted





by this initiative, such as the 21-day menu cycle, have resulted in our Culinary Specialists still having to perform many labor-intensive activities while afloat.

It is our intent, in accordance with the *Commander's Guidance* and the concepts put forth in the ASDOF initiatives, to review all aspects of the current inventory management of food service operations afloat, to seek efficiencies, and to reduce the overall work load for our sailors afloat. Furthermore, we will evaluate whether the opportunity exists to leverage current technologies and current practices in order to discover ways to reduce the manpower footprint afloat and create challenging and career-enhancing billets for our Culinary Specialist's ashore, thereby improving the overall quality of life for our sailors afloat and ashore.



## II. Literature/Methodology

### A. Literature

There is a paucity of research and literature available on the topic of food services, inventory processes, and food management. This thesis represents a contribution to the study of inventory management in general and food inventory management in particular. Although there has been little written on the subject, there are two specific documents that were useful in informing our research. The first, by Lindell, Siewertsen, and Yidiski (1996), argues that food service is one of the most important components of the Navy's Quality of Life Program. All sailors look forward to three hot, nutritious meals a day, served on clean, well-appointed mess decks. However, the challenges that face our food service professionals are numerous and complex and some cannot be solved at the shipboard level.

The second useful document was *Chief of Naval Operations Guidance 2010*. This insightful document discusses the priorities of Admiral Roughead, Chief of Naval Operations. In the CNO's *Guidance*, one of the three top goals is to develop and support our Sailors, Navy civilians, and their families. In order to accomplish this goal, he wants to decrease the amount of time that sailors are at sea. One of the recommendations in this thesis is to do exactly that—find ways to move tasks ashore that are traditionally performed onboard ships, thereby reducing the number of Culinary Specialists assigned to ships. This change will serve to improve the morale of the sailor and, in turn, will help support their families. A sailor stationed on land rather than at sea is also less expensive for the government. One of the CNO's critical goals is to decrease overall government spending. This guidance was pertinent to us because we felt that the CNO's expressed wishes were achievable outcomes. Our research was based around the CNO's priorities, and we conducted our research with his goals in mind.



## B. Methodology

Our main research method was conducting on-site inspections and interviews of key players in the order-and-receipt process. We started by visiting the San Diego Naval Shipyard and speaking to every person directly involved in the ordering, processing, receiving and overall management of the food-delivery process.

## C. Naval Supply Systems Command Players

The title of LSC Subsistence belongs to a civilian who is in charge of reading the food orders sent from the ship and ensuring they are accurate and complete. She validates (or provides) a “sanity check” for the ship to ensure that quantities and units of issues are correct. She also coordinates the working parties that assist the ship in bringing the food onboard once it arrives on the pier.

The Officer in Charge of San Diego’s Navy Food Management Team at Fleet Industrial Support Centers (FISC) is considered one of the most knowledgeable Subject Matter Experts (SMEs) in food service operations afloat in the Navy, with over 25 years of Food Service Management experience. He is the Division Officer in charge of the Navy Food Management Team in San Diego, and his insights were beneficial in helping us contact the right people to assist us with our research.

The Logistics Support Team/Food Service Officer Ashore coordinates with all personnel involved in the ordering process and plays a key role in ensuring that afloat units receive the provisions they need to maintain operational readiness. Onboard a ship, the Food Service Officer (FSO) is directly responsible for the S-2 division. The FSO is usually a new Ensign with very little experience in running a galley, so he relies heavily on his/her Chief Petty Officer or senior Enlisted Petty Officers for assistance. The Food Service Officer ashore is a senior enlisted member with vast amounts of knowledge on food service. His real mission is to assist the FSO on the ship with getting exactly what he needs to perform his mission.



#### D. Prime Vendor (US Foods)

The Prime Vendor Office Manager is the representative for the Prime Vendor and coordinates all packaging and delivery of food to the ships. He was instrumental in assisting us by informing us when his trucks were leaving the warehouse and what time they would be arriving at the ships that requested food. This information allowed us to conduct timed research on five ships during our visit.

#### E. Ships and Assigned Personnel

We conducted extensive research into the time required to handle food, conduct inventory counts, and deliver food to its intended destination; we refer to the time that passed to complete a task as the time evolution. We also recorded “standing around,” or idle times, where working-party personnel were not working or producing a value-added outcome. To gain permission to perform these time evolutions, we contacted the Supply Officer on every ship to ensure that there were no problems with us standing on the pier and recording times for the evolutions. We knew when the Prime Vendor was supposed to arrive on the pier, so we arrived 30 minutes prior to this time in order to witness the entire process. Our timed evolutions were extensive and provided answers to the following questions:

- Did the Prime Vendor arrive on time?
- How long did it take to offload material from the truck?
- How long did it take the Ship Representative to inventory the delivery?
- Did the Stevedores arrive on time?
- How long did it take to transfer the food from the truck to the staging area?
- How long did it take to move the food from the staging area on the pier to the ship storage area?
- How long were people standing around doing nothing?



We also conducted a phone interview with the Food Service Director (05), Naval Supply Systems Command, Mechanicsburg, PA, as well as doing face-to-face interviews with numerous Supply Officers, Food Service Officers, Leading Culinary Specialists, Jack of the Dusts and Record Keepers concerning food ordering and receipt processes.

We incorporated all of the knowledge we gained through our interviews and timed evolutions and constructed different plans that we felt would enhance the efficiency of many of the Navy's current processes in both ordering and receipt processing. Our goal was to understand the strengths and weaknesses of the current system and try to expand on those strengths while minimizing the weaknesses. We also wanted to come up with new and more efficient personnel roles that would help save time and money in the current process.



### III. Inventory Records Keeping

#### A. Introduction to Records Keeping

Records keeping is a very complicated and difficult task for young Culinary Specialists to perform, especially when the primary skill they are taught is to prepare meals. The accounting procedures currently used by Records Keepers are required in all general messes, and account for receipts and expenditures of all food items. According to the *Naval Supply Systems Command P-486*, the following are the main purposes of completing financial returns and performing records-keeping activities:

- Establish accountability
- Serve as the basis for analyzing, separating, and presenting appropriation and cost-accounting charges
- Present vouchers substantiating entries in the account of Food Service Officers for review by the Department of the Navy and the General Accounting Office
- Ensure compliance with government budgetary-control measures
- Make it easier to compile statistics for logistics planning in various offices, commands, or bureaus
- Provide statistical information necessary for future ration allowances

#### B. Records-Keeping Procedures and Documents

The Navy currently requires an abundant amount of paperwork and forms to meet accountability, compliance, and analysis objectives. The Records Keeper is currently tasked with providing the following:

- General Mess Summary Document (Naval Supply Systems Command Form 1359)
- Stores Consumed (Naval Supply Systems Command Form 1059)
- Food Costs (Naval Supply Systems Command Form 338)



- Cash Meal Payment Book (Department of Defense Form 1544)
- Sale of General Mess Meals (Naval Supply Systems Command Form 1046)
- Subsistence Ledger (Naval Supply Systems Command Form 335)
- Record of Receipts and Expenditures (Naval Supply Systems Command Form 367)
- Food-item Request/Issue Document (Naval Supply Systems Command Form 1282)
- Recapitulation of Meal Record (Naval Supply Systems Command Form 1292)
- Food-Preparation Worksheet (Naval Supply Systems Command Form 1090)

All of these documents are required to be electronically delivered to Naval Supply Systems Command. In addition to the work required of the Records Keeper to meet accountability, compliance, and analysis objectives, a Food Service Officer must verify that the accounting classifications are correct as well as calculate the days the general mess was open since the last report was submitted. The Food Service Officer must also calculate how many days food was served out at sea and in port. These efforts are complicated by the varying data-connectivity conditions of ships at sea. As with all smaller ships in the Navy, connectivity at sea is limited, and it is often difficult to transmit these documents even when there is connectivity.

In order to obtain all of the information necessary for the Records Keeper to complete many of these forms, it is essential that either a partial or full physical inventory of the food be conducted. This inventory is conducted by the Bulk Storeroom Custodian, and witnessed by either the FSO or the Leading Culinary Specialists to ensure accuracy of the report. A physical inventory is a process of identifying, counting, and evaluating all subsistence on hand at a specified time. This inventory is required to complete the forms listed above as well as finish the following tasks:



- Establish and reestablish financial accountability and responsibility
- Determine the dollar value of the subsistence on hand so that the required financial reports can be prepared
- Check on the accuracy of subsistence ledgers and adjust any differences that may exist between the subsistence ledgers and the subsistence on hand
- Determine the dollar value of subsistence shortages due to spoilage, damage, waste, pilferage, or other losses not reflected on subsistence ledgers
- Identify subsistence shortages, overages, and determine financial liability
- Serve as a management tool for subsistence inventory controls

Conducting partial and full inventories is helpful for the Records Keeper, but it is a time-consuming and difficult task to perform. It may also create errors in the system—too much cycle counting can actually be counterproductive. The *Naval Supply Systems Command P-486* recommends that prior to the inventory, the Records Keeper should ensure that all receipts, transfers, surveys, returns, and issues to the general mess are up to date and posted. Issues that have been posted should be separated from stocks to be inventoried. All subsistence items should be arranged to make counting easier. Additionally, the *Naval Supply Systems Command P-486* recommends that similar items be kept together—neatly stacked, visible, and in Food Item Code (FIC) sequence in each storeroom, where possible. The freezers and reefers on “small-boy” ships are relatively small to begin with, so the inventory process often calls for the food to be taken out of the storage units first and then counted in a more open area for better accuracy. Because this is such a time-consuming effort, it is often necessary to perform this task in the middle of the night so that it does not affect normal galley operations or hinder meal hours. When in port, meals are often not cooked on inventory days, so the ship resorts to buying pizzas for the crew, using money from the Morale and Welfare Program so that the cycle count can be conducted.





Food Service Officers are expected to maintain an inventory validity rate of 95% at all times, so it is imperative that these inventories are completed. Currently, the number one reason why FSOs are relieved of duty is because of inaccurate inventories, which is why these inventories are conducted more and more often at the request of the FSOs. FSOs also conduct spot inventories of subsistence items in the bulk storeroom at unannounced times during the course of the monthly accounting period. A minimum of 5% of subsistence line items maintained in the bulk storeroom are inventoried at least twice a month (for a total of 10% monthly). Spot inventories should concentrate on high-value and fast-moving items. Each spot inventory requires the presence of a Records Keeper, and all necessary paperwork must be completed to record the results.

Additional forms that are required by the Records Keeper are those used for break-outs and break-backs. This procedure is used when the bulk storeroom custodian conducts an inventory of the remaining subsistence items after each break-out or issue is made. The Bulk Storeroom Custodian indicates the balance-on-hand on each Food Item Request/Issue Document (Naval Supply Systems Command Form 1282) after making each break-out or issue. The Records Keeper compares this balance after decreasing the break-out or issue on the Subsistence Ledger (Naval Supply Systems Command Form 335). The Records Keeper and either the Food Service Officer or the Leading Culinary Specialist examine the differences and make a determination based on the results of this examination. It is ultimately up to the Food Service Officer to apply a valid entry.

### C. Food Service Management

Almost all of the forms necessary to track and manage food are generated using the Food Service Management (FSM) system. The Space and Warfare System Center developed the FSM system, which was certified by Naval Supply Systems Command for use by Navy general messes. The Food Service Management system automates all record-keeping functions and produces most forms required by the *P-486*. By using this system, the accuracy of records is



significantly increased, and mathematical errors are virtually eliminated, assuming the correct numbers are being entered. Although the Food Service Management system provides some relief in terms of providing the necessary forms all in one place and making simple calculations, some initial training and familiarization time is still required for the Records Keeper, it does not negate the need for the Food Service Officer and Culinary Specialists to understand the concepts behind food service records and procedures. Once all of the Food Service Management records have been completed electronically, they must be delivered to Naval Supply Systems Command, where the information is evaluated and maintained. Bandwidth is a critical resource that determines how quickly the necessary records can be delivered to Naval Supply Systems Command. Additionally, the Food Service Management system sometimes goes down. Because it is the only software authorized for use by Navy general messes, and because there is no alternative or back-up system in place, records-keeping duties must be performed manually and then later entered into the Food Service Management, either while the ship is at sea or coordinated with the shore. Because Food Service Management is prone to going down, the Records Keeper has to continuously perform back-ups to save all current data inputted into the system. When the ship is at shore, this requirement does not pose as severe a problem because subject-matter experts who are able to assist are not far away. However, if a ship is at sea and cannot regain connectivity with the system, then hand-written records need to be kept until the ship returns to shore. At this point, personnel have to physically re-input into the system all information that was lost from the moment when the system went down.

The responsibilities of a Records Keeper are immense and continue to grow. As the military continues to downsize crew-manning onboard vessels, records-keeping tasks will continue to be a burdensome process. Most Records Keepers never see the galley when they are assigned this task. Records keeping is an around-the-clock responsibility since food is broken out all through the day to keep up with the four meals served (breakfast, lunch, dinner and midnight rations). However, there are times when ships are under-manned, and the Records Keeper



must be called upon to provide assistance in the galley to cook meals. This is when the responsibilities of records keeping can become overwhelming. In addition to these regular duties, a Records Keeper who is aboard a ship with helicopter squadrons attached must know when the pilots will be flying. The pilots need to be fed as well, and the meal that was broken out for the day may not be conducive for consumption while flying a helicopter (e.g., spaghetti, soup, etc.). Not only do the Records Keepers need to have the appropriate meals broken out for the crew to eat, but they may also have to break out additional meals that are pilot-friendly. This applies not only for the ship to which the Records Keeper is assigned, but also for the pilots of any other ship who land on deck and request a box lunch.



## IV. Receipt Process

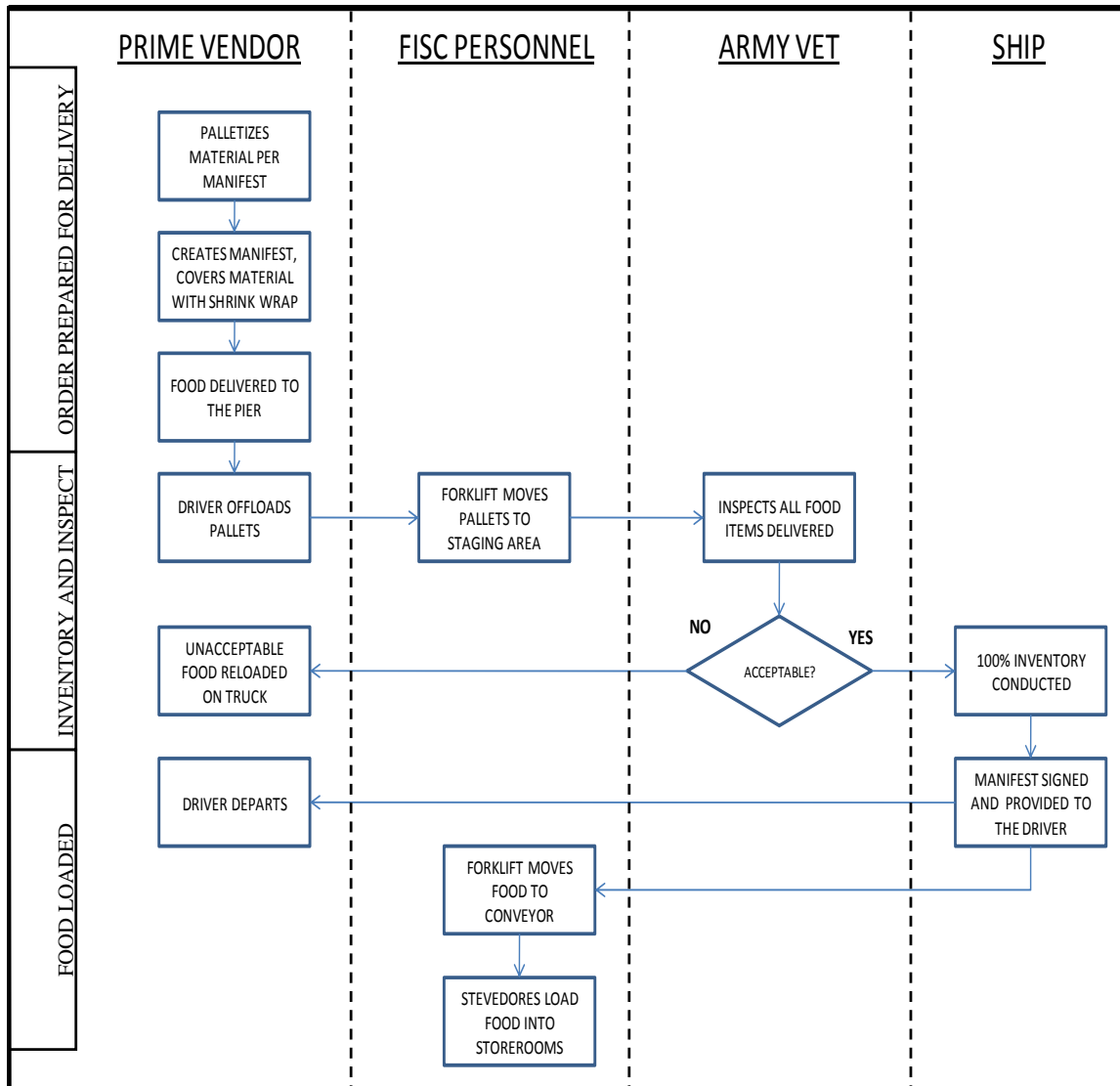
### A. Introduction

During this discussion, our focus is primarily on the receipt process for afloat units. This entails all aspects, from the Prime Vendor preparing the final order for delivery, to the food being loaded on the ship. The current process is time consuming, often as a result of the policies set forth by *Naval Supply Systems Command P-486*. These policies drive inconsistencies that take up time for the ship's crew and waste the Navy's money.

The receipt process is a cumbersome and time-consuming endeavor. Through process analysis, we will analyze all participants involved in each step and review their current policies. We will evaluate where efficiencies can be gained, and show how the Navy can capture savings in both time and money.

The receipt process for the five ships we visited was similar in every aspect, with only small variances. The receipt of subsistence involves many separate steps including planning, inspection, and inventorying, processing receipts, posting records, and paying dealers' bills (see Figure 1)





**Figure 1. Current Receipt Process**

From discussions with Supply Officers during our field research, and based on personal experience, we have learned that ships outline their receipt process in a ship-specific, standard operating procedures instruction, based on the information provided by the *Naval Supply Systems Command Publication P-486*, the overarching policy document for Food Service Management. These ships' instructions indicate the following: the number of personnel each department must supply in the event that a working party is not provided, an outline of how the ship

will plan for the delivery in the schedule, and how any necessary re-organization of storerooms will be conducted in preparation for the anticipated delivery.

## B. NAVSUP Inspection/Inventory Policy Guidance

The Food Service Officer is responsible for establishing procedures to ensure products received from the Prime Vendor conform to the contract and are inspected at the destination for quality and quantity. Per the *P-486*, “Food Service Officers will inspect all subsistence items to determine the exact quantity received—to verify that all products are received in excellent condition—and will sign the necessary papers in black ink to acknowledge receipt” (NAVSUP P-486, 2004, ). It is important to note that for all deliveries by any source other than the Prime Vendor, the material received must be inspected either by a member of the US Army Veterinarian Inspection Team (Army VET) or by responsible military medical personnel. In addition to conducting a complete inventory and quality inspection of all material, the Food Service Officer must ensure that all material received is of the item type, style, and grade as ordered. This requires that during the inventory process, the receipt inspector review each label, ensure that the ship is receiving the material it ordered, and check each item for expiration dates. This necessitates that the inspector not only be diligent in the performance of his/her duties but also have the necessary training to quickly determine the shelf-life requirements for each item and the shelf-life remaining at receipt.

Prior to the following discussion, it is important to note that all descriptions that follow, with regard to the actions performed by the Prime Vendor, reflect those as performed by US Foods (the company that currently holds the subsistence prime vendor contract for the San Diego region). US Foods provides approximately 80% of all food items delivered to both afloat and ashore food service operations in the region. The only items they do not directly deliver are fresh fruits and vegetables (FFV), dairy, and bakery products. US Foods, with concurrence from the Navy, has sub-contracted with smaller companies in the region to provide delivery for these perishable items and, as the prime contractor, has dictated that the sub-contractors



adhere to the same stringent US Foods policies for all aspects of quality control, including freshness, quality, and accuracy.

#### C. Order Prepared For Delivery

Upon receipt of the final order from the Logistic Support Center, the Prime Vendor will stage the items in the warehouse in preparation for the scheduled delivery. Once all items have been consolidated in the staging area, the material is inspected for quality control, and a dedicated quality-control team employed by US Foods conducts a second count. US Foods has a vested interest in the accuracy of their orders since the contract that they entered into with the Navy has the expectation that they meet or exceed 98% accuracy for all deliveries. The contract also stipulates that quality is equally important since the contract also expresses a 98% acceptability for all food items delivered. Once the order has been checked for quality and accuracy, the material is placed on a pallet, shrink-wrapped to protect the shipment in the event of inclement weather, and a final-delivery manifest is generated. Based on the required delivery schedule, the truck is loaded, and the material is delivered to the pier.

#### D. Inventory and Inspect

Once the driver arrives on the pier—and prior to offloading the food items—he/she will first locate the ship, make contact with the ship representative responsible for coordinating the delivery, and then provide him/her with a copy of the manifest. At this point, we noticed that there were significant variances between the receipt processes of the five ships. For two of the five ships, the Records Keeper was responsible for inspecting and accepting the order. For the remaining three ships, either the Bulk Storeroom Custodian or the Leading Culinary Specialist performed this function. Once the ship representative conducted a preliminary check of the manifest to ensure that it was the correct delivery, the driver offloaded the pallets using a pallet jack. This process took approximately four to six minutes per pallet. Once material was offloaded, a forklift driver (provided by the same company



that currently provides the working party personnel) moved the pallets to a staging area, where a member of the ship's crew conducted a complete inventory of all material delivered. This inventory serves three main purposes. First, it ensures that the accurate number of each item is visually cited so that it correctly reflects what is on the manifest. Second, it ensures that the description of the item is correct according to what the manifest says the ship is receiving. Third, it serves as a quality check of all material to ensure that packaging is not damaged, or that the items have not passed their expiration dates (shelf-life concerns). If the ship is receiving FFV or perishable items, then either a medical representative or a member of the Army Veterinary Team will inspect the material prior to acceptance. The representative who is counting items will annotate on the manifest that the material is received by a process known as *Circle, Sign, and Date* (see Figure 2). If all material is accounted for and acceptable in quantity, then the ship representative will circle the quantity on the manifest. If there is a discrepancy (e.g., 9 cans of corn instead of 10), then he/she will line out the "10" and hand write in a "9" and circle it. Once all items on the manifest have been accounted for accordingly, the ship representative will sign the manifest and place the date on it. For those items that require inspection by a certified medical representative or Army VET, the medical department will annotate and sign the manifest to indicate that those items were inspected (see Figure 2). This inspection for the five ships took an average of 9.2 minutes per pallet.







## E. Food Loaded

It is important to note that no food can be loaded until the entire order has been inspected and verified for accuracy and the manifest has been signed and presented to the driver. Not until the entire order has been inventoried and accepted, and a signed manifest provided to the driver, can the driver depart. It is at this stage when the forklift driver moves the pallets of food to the conveyor, and the stevedores load the material into the storerooms.

### 1. Timeline

Following are the actual delivery times of five small-boy ships that were evaluated during the research.

#### ▪ Ship A

- The US Foods truck arrived on time.
- Took ten minutes to remove five pallets from the truck.
- Took 50 minutes for Records Keeper to count the line items.
- Took five minutes for the forklift to re-position the pallets near the conveyor.
- Took 50 minutes for the stevedores to get the food on the ship.

➤ **AVG: To count one pallet took 10 minutes.  
To load one pallet on the ship took 10 minutes.**

#### ▪ Ship B

- The US Foods truck arrived on time.
- Took 16 minutes to remove nine pallets from off the truck.
- Took one hour and 30 minutes for the Records Keeper to count the line items.
- Took eight minutes for the forklift to re-position the pallets near the conveyor.



- Took one hour and 20 minutes for the stevedores to get the food on the ship.
- **AVG: To count one pallet took ten minutes.**  
**To load one pallet on the ship took nine minutes.**
- **Ship C**
  - The US Foods truck arrived on time.
  - Took 12 minutes to remove seven pallets from off the truck.
  - Took one hour for the Records Keeper to count the line items.
  - Took five minutes for the forklift to re-position the pallets near the conveyor.
  - Took one hour for the stevedores to load the food onto the ship.
  - **AVG: To count one pallet took nine minutes.**  
**To load one pallet on the ship took nine minutes.**
- **Ship D**
  - The US Foods truck arrived on time.
  - Took 22 minutes to remove 15 pallets from off the truck.
  - Took one hour and 50 minutes for the Records Keeper to count the line items.
  - Took 12 minutes for the forklift to re-position the pallets near the conveyor.
  - Took two hours and 10 minutes for the stevedores to get the food on the ship.
  - **AVG: To count one pallet took seven minutes.**  
**To load one pallet on the ship took nine minutes.**
- **Ship E**
  - The US Foods truck arrived on time.
  - Took 10 minutes to remove six pallets from off the truck.
  - Took one hour and five minutes for the Records Keeper to count the line items.
  - Took five minutes for the forklift to re-position the pallets near the conveyor.



- Took 58 minutes for the stevedores to get the food on the ship.
- **AVG: To count one pallet took 10 minutes.  
To load one pallet on the ship took 10 minutes.**
- ❖ **Overall Average: To count one pallet took 9.2 minutes.  
To load one pallet on the ship took 9.4 minutes.**

**The average number of pallets loaded onto the ships was 8.4 pallets, which equates to the following:**

- ✓ **One hour and 17 minutes to count the food.**
- ✓ **One hour and 19 minutes to load the food onto the ship.**

To assess this even further, a timeline was created for the entire process from delivery of the food to the food being brought onto the ship. This timeline is for a five-pallet order of food, consisting of four pallets of refrigerated food, and one pallet of frozen food.

- 0800—The forklift driver, conveyor, and Prime Vendor driver arrive at the pier.
- 0817—The pallets are offloaded from the truck.
- 0820—The pallets are moved to the staging area.
- 0825—The working party arrives, and inspection and inventory begins.
- 0915—The Inspection is completed.
- 0920—The paperwork is completed and the driver departs.
- 0925—The first pallet is moved from the staging area to the conveyor.
- 0926—Onload begins.
- 1016—Onload is complete.
- 1025—The Working Party and the forklift driver depart.



## F. Calculating Costs

When calculating the costs associated with the receipt process, three distinct costs required discussion: 1) the opportunity cost to the ship, specifically with regard to the key personnel involved during this process; 2) the capital costs associated with paying the civilian-contracted working parties that actually performed the labor of moving the material from the pier into the storerooms; and 3) the indirect cost incurred as a result of the delivery driver dedicating time while awaiting the completion of the inventory and inspection process.

### 1. Opportunity Cost to the Ship

For each delivery, there are four crewmembers that play major roles in the process. The Food Service Officer should be involved with each delivery, schedule allowing. Since the receipt process is vital to inventory management and since the Food Service Officer is ultimately responsible for the inventory, it is in his/her best interest to be present to ensure the process is being conducted quickly and effectively. The Leading Culinary Specialist or Records Keeper is usually tasked with conducting the inspections and performing the counts on all material delivered, checking for both accuracy and quality. The Bulk Storeroom Custodian, the ship's crewman responsible for maintaining all provision storerooms, is also usually present, assisting in the inventory process when necessary and getting an idea of what items and how many of them are being delivered into his/her storerooms. He/she will also take this opportunity to annotate the Food Identification Code and date received on each item. Placing the date on each item is critical to maintaining a proper stock-rotation plan under the First-In, First-Out (FIFO) principle. The last member involved is either an Army VET or, in that individual's absence, a medical representative from the ship, who is responsible for inspecting perishable items.

On average, as we mentioned earlier, a five-pallet delivery takes approximately two hours and thirty minutes from the time the food arrives on the pier to when it is loaded in the storerooms. Provisions are predominantly delivered during



the morning hours (before noon), allowing the Prime Vendor driver to complete his/her drop off and return the truck in time to have it loaded for the next day's deliveries. As for the ship, morning deliveries are far easier to coordinate than those scheduled for the afternoon. In the morning hours, the Food Service Officer knows who is onboard, and he/she can begin coordinating the day's personnel requirements, including scheduling and coordinating if a food delivery is anticipated during Morning Quarters (Quarters is a part of the ship's daily routine, and during this time muster is taken and the day's schedule is briefed.). However, while it appears on the surface that the morning delivery is advantageous to all, it does represent some considerable challenges to the crew. First and foremost, the Food Service Division spends each morning of each day performing two demanding tasks: the first is cleaning up from breakfast, and the second is preparing the next meal. While in port, lunch is the largest meal served onboard any ship, since a majority of personnel not on duty will eat breakfast and dinner at home. As such, the lunch meal requires the greatest amount of effort, and, on those days that the ship is scheduled to receive food, three key personnel (Food Service Officer, Leading Culinary Specialist, and Bulk Storeroom Custodian) will be unavailable to perform their primary duties. Since the Bulk Storeroom Custodian is the only member of the crew with access to the storeroom spaces and the only crew member responsible for breaking out food for preparation of each meal, he/she is a crucial part of the team when it comes to meal preparation. If the custodian is on the pier performing his/her receipt duties, then he/she is not readily available in the event that the Culinary Specialists preparing the day's lunch require additional ingredients. If additional ingredients are required, then the Bulk Storeroom Custodian will be forced to cease performing his receipt functions and provide those necessary items to the Culinary Specialists preparing the meal. Each time this occurs, an already lengthy process becomes longer. Since the Leading Culinary Specialist and Food Service Officer are on the pier during the receipt process, additional work is placed on the Culinary Specialist preparing the next meal. Lastly, the medical representative will be taken away from his/her duties to perform quality-control checks on the delivery. This can



create difficulties, especially since small units traditionally only have one or two Hospital Corpsmen assigned. Since sick call is usually conducted first thing each morning, either the receipt process or the medical services to the crew will be interrupted.

In addition to taking the Culinary Specialists away from their primary duties, training and shipboard drills are usually scheduled during the morning hours when the ship is pier-side. Often, the ship will avoid conducting certain training evolutions during periods when the ship is receiving provisions, due to the interference caused by the physical presence of the Working Party loading stores and the possible absence of key members.

## **2. Working Party Costs**

In 2002, as a result of the Afloat Supply Division of the Future (ASDOF) initiative, the Fleet and Industrial Supply Center Contracting Division awarded a \$172-million contract to a company called FSS Alutiiq to provide logistic and support services for the Navy globally. This contract was awarded as an Indefinite Delivery, Indefinite Quantity (IDIQ), time-and-materials contract to provide civilian-contracted support to assist the ships in loading provisions—a task previously performed by the ship's crew. Since this is an IDIQ contract, FSS Alutiiq charges the government for each working party assigned based on the number of personnel and the length of time required completing the load out.

If a ship receives an order that is large enough to entitle the ship to receive a working party (see Table 1), the following personnel and material are assigned for each working party.

- One Supervisor
- One Forklift with a driver
- One Conveyor Operator (the conveyors are Government-furnished equipment)





- A fifteen-man working party

Based on our findings, these 18 personnel are on-site for approximately two hours for each delivery of just five pallets, leading to charges to the government as described in Figure 3.

$$\begin{aligned} &15 \text{ Workers} \times 2 \text{ hrs} \times (\$29.18) + \\ &1 \text{ supervisor} \times 2 \text{ hrs} \times (\$41.24) + \\ &1 \text{ forklift driver} \times 2 \text{ hrs} \times (\$34.27) + \end{aligned}$$

**Figure 3. Hourly-Charge Calculations**

To come up with our hourly-wage figures for the working party, we utilized the wage schedule from the International Longshore and Warehouse Contract. The contract specifically breaks down skill levels by applying skill rates next to applicable job descriptions. We took those rates or hourly wages and multiplied them by the number of workers and the average length of time to complete a five-pallet delivery (which was two hours). That is how we arrived at the \$1,084.78 total dollar value.

While we in no way question the value added for having these civilian contractors assist the ship in loading stores and for the significant improvement in the quality of life for our sailors, we do have a significant concern with regard to the utilization, or rather the under-utilization, of these working parties. Based on our field research and past experience, we have come to the conclusion that for almost 50% of the time that each working party was on location, they remained idle while awaiting the completion of the receipt process. On average, based on data collected from the five ships we witnessed, the stevedores spent some 50.3 minutes idle, waiting for the ship to complete the inventory and associated paperwork. This translates to a waste of over \$455 per delivery per ship. Based on the number of ships in the Fleet and the inconsistency in the frequency in which each ship places orders for provisions, it would be very difficult to determine an estimated savings.





However, insight into the potential savings can be gleaned by approximating the annual delivery frequency of a smaller class ship. Based on extensive experience in this area (the authors have over 12 combined years working as Supply Officers afloat), a Cruiser-sized ship receives approximately three food deliveries a month, or 36 deliveries per year. While ships do at times receive food while underway, approximately 90% of all deliveries occur pier side. As such, a single smaller-class ship will receive 27 food deliveries per year. Based on a waste of man-hours equating to \$455 per delivery, multiplied by 27 deliveries, that single ship wastes over \$12,285 per year. As a conservative estimate, if we were to multiply this amount by the number of ships currently in commission (286), we find that there is an overall waste of over \$3.5 million dollars a year.

Based on the enormity of the current logistic and support services contract and on the capital invested, it is incumbent on all Navy leaders to seek ways to gain efficiencies in the receipt process and to reduce waste from having idle working parties. This will ensure that the government is getting the maximum effort for their expenditure and will guarantee continued support for this valuable initiative.

### **3. Cost to the Prime Vendor**

While the cost to the Prime Vendor may appear to be insignificant, he/she will contribute to the overall gains that can be realized by conducting the receipt process with greater efficiency.

On average (of the five ships studied), from the time the driver arrived on the pier to the time he/she received the signed manifest, over one hour and 20 minutes elapsed. During this time, the driver is actually being paid for sitting in his/her truck, in no way contributing to the receipt process. While on the surface this may appear to be a cost that the Prime Vendor must bear, in actuality these costs are being passed along to the Navy. Additionally, since all deliveries are scheduled to be completed by noon each day, the warehouse will only load each truck for two to three deliveries per day. As a result, the trucks often leave the warehouse less than



70% utilized. This was confirmed by our observation of the five deliveries and through discussions with the drivers. All five drivers admitted that they traditionally left the warehouse half to three-quarters loaded, specifically when their delivery schedule included smaller units.

The Navy should seek ways to reduce the time each driver is required to remain on the pier for each delivery to optimize utilization of natural resources (fuel), greater space utilization of the vehicles, and improved scheduling flexibilities for the ships.



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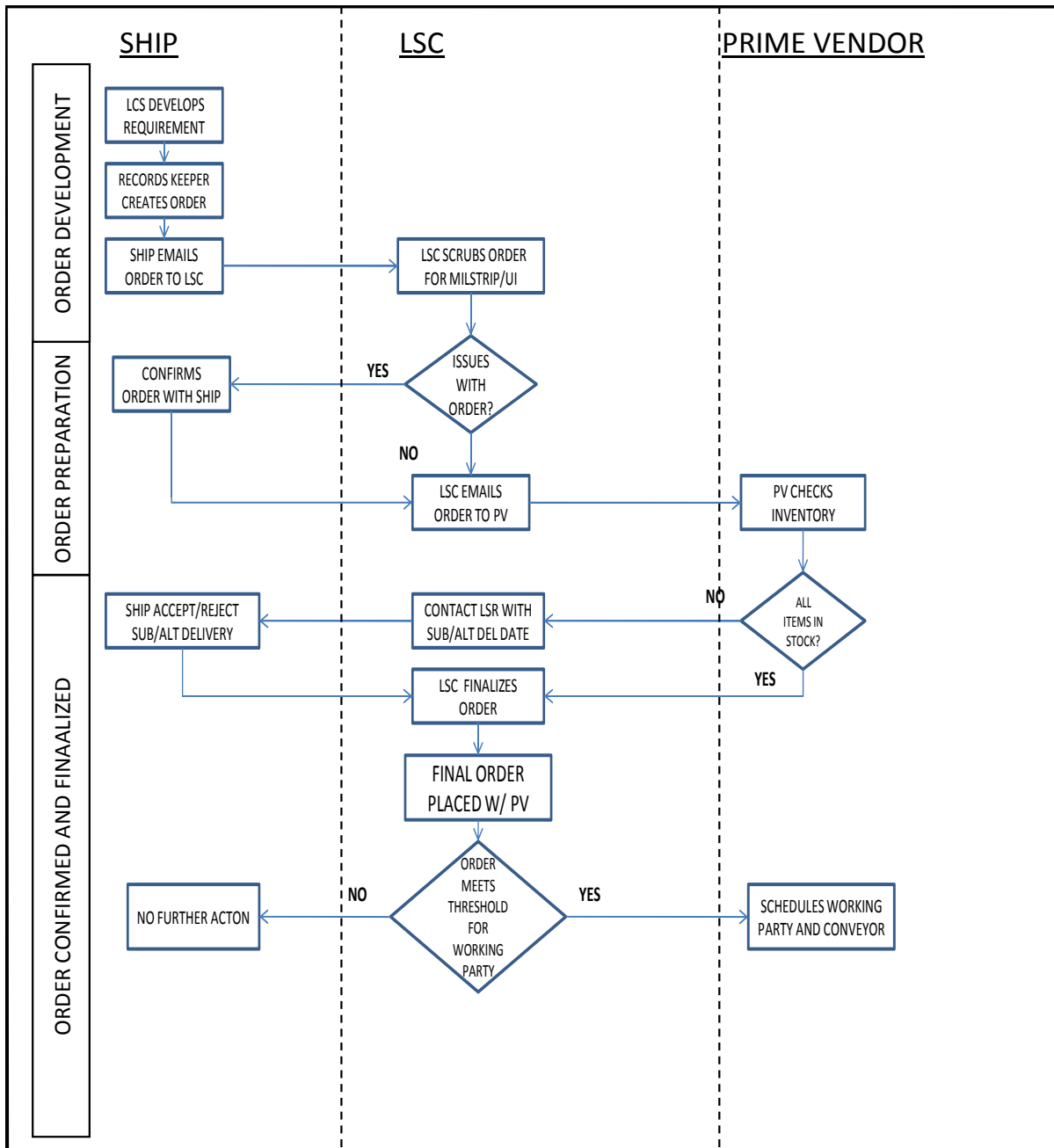


## V. Ordering Process

### A. Current Ordering Process

The ordering process for subsistence onboard ships is a critical, labor-intensive, and time consuming process. It is during this process that deployable units, whether pier-side or underway, replenish the necessary food stores to enable the Food Service Department to adequately feed the crew; this process is also a limiting factor to every ship's operational capability. The key personnel involved in the pier-side process are the following: the Jack of the Dust, the Bulk Storeroom Custodian, the Leading Culinary Specialist, the Records Keeper, the subsistence logistics support representative, and the order receiver at the Prime Vendor warehouse. This process involves many back-and-forth transactions between the above-mentioned personnel, and has been broken down into the possible steps that could take place (see Figure 4).





**Figure 4. Current Order Process**

The ordering process of five small-boy ships on the waterfront was tracked to determine the average time it took to complete all steps of the receipt process, and to evaluate any inefficiencies or efficiencies from the practices that are currently

being utilized on the waterfront. The following steps detail the results of the information captured:

- Developing the requirements
- Creating the order
- Confirming the order
- Finalizing the order

## B. Order Development

The beginning of this process starts with food service personnel determining what items they need to place on order. Traditionally, the Leading Culinary Specialist and the Jack of the Dust perform this task, physically visiting all storerooms and refrigerated spaces (including the freezers) to determine what items are low on quantity and to compare the current inventory with the upcoming menu cycle. During this visual inspection, the Leading Culinary Specialist determines which items need to be ordered and in what quantity. There are many considerations that the Leading Culinary Specialist needs to keep in mind when generating each order. The ship's current schedule will determine the size of each order and which items need to be ordered. Units that are pier-side traditionally serve considerably fewer meals than when underway. To avoid waste through spoilage, the Culinary Specialist must be mindful not to order perishables in quantities that exceed the anticipated consumption. Since storage space on smaller units is constrained, over-ordering can also pose additional challenges. Careful planning is essential when managing and maintaining an inventory that adequately reflects the needs of the ship, based on its schedule. If the ship is getting underway in the near future, the Culinary Specialist must proactively review the menu and adequately plan how much of each item to order. While this responsibility falls on the Leading Culinary Specialist, ultimately the Supply Officer is accountable for this review. The Supply Officer must ensure that his/her Leading Culinary Specialist has the requisite background and experience to carry out this task. There is nothing that will cause the CO to lose confidence in his



Supply Officer faster than if the ship were to run out of white milk four days into a 14-day underway period. The Leading Culinary Specialist must keep in mind any special meals (e.g., holiday meals) that may be coming up, since lead times (for specialty items, such as turkey) may be greater. It is also important to pay particular attention to staple food items, such as milk, flour, eggs, etc. The completion of these duties places a tremendous amount of responsibility on the Leading Culinary Specialist from the officer corps onboard the ship. If the Culinary Specialist responsible for generating orders errs in any way, the results of those errors will reflect on both the Food Service Officer and the Supply Officer, who are forced to rely on the professional knowledge of the Culinary Specialist. One new program recently developed and instituted by the Naval Supply System Command that eases this planning process is the 21-day Cycle Menu. This menu was developed and implemented throughout the fleet so that each galley, afloat or ashore, is serving the same meals on the same day. As a result, planners will always have the ability to look into the future and have a fairly accurate idea of what food items and ingredients will be required onboard.

Once the requirements are developed, the ship needs to create a list of items to be placed on order. Once the Leading Culinary Specialist determines what food items are needed, he/she will go back to his/her office and generate a manifest of those food items. The Leading Culinary Specialist will then take this information (usually presented in the form of handwritten notes) to the Records Keeper for processing. At this stage, the Records Keeper generates the order. The Records Keeper uses the Food Service Management System to get the stock-keeping unit (SKU), which is a unique identifier for each distinct product that can be purchased from the Prime Vendor. He/she will then create an electronic order, with billing information in the form of MILSTRIP in either Word or Excel format.

#### C. LSC Creates Order

Once the Records Keeper has created the order, the Leading Culinary Specialist will review the final product for approval and then e-mail it to his/her



homeport Logistics Support Center (LSC). The LSC is a single point of contact between the ship and shore support sources. The LSC is a result of a collaborative effort between the FISC, the Type Commanders, and Naval Supply Systems Command, and offers its customers a wide array of supply and logistics support. The LSC's mission is to support the fleet by shifting the workload from ship to shore, thereby improving the crew's quality of life. The Supply Officer Afloat utilizes a staff of logistics support representatives to provide husbanding services for part support, hazmat delivery and offload, and brokering of public work services. They are also a point of entry for all subsistence requisitions. Located at each LSC is a subsistence logistics support representative that acts as a single point of contact between the ship and the Prime Vendor. This representative is responsible for a variety of support functions during the ordering process, the first of which is to receive orders and review them for accuracy. During this review, or "scrubbing" process, he/she will review each SKU to ensure that the numbers match the description of the item being ordered, as well as the unit of issue and price. He/she performs a sanity check on each order to ensure that the ship has not made a mistake and ordered an unreasonable quantity of any given product or item. This is important, because one of the most common errors made during the order process deals with the unit of issue of the item being ordered. All too often, Records Keepers, in the process of generating an order, will incorrectly annotate on the order form the quantity of issue for a particular item being ordered, for example writing "EA" for each instead of "CS" for case, or vice versa. Either way the ship will receive either too much or too little of an item, which can cause significant inventory problems for the ship. During the review process, if the LSC Representative perceives that there is a problem with the order, he/she will contact the ship for assistance, ensuring the ship receives the correct product in the right quantity. After receiving confirmation from the ship, the Logistic Support Representative (LSR) will make any necessary corrections and transmit the order to the subsistence Prime Vendor.





#### D. Confirmation of Order

Upon receiving the order from the LSC, the Prime Vendor will perform an inventory stock check for the items required. If any of these items are not in stock, then the Prime Vendor will research his inventory for potential substitutes. He will then contact the LSC and inform them that there is a line item not available and offer two choices: a substitute item (like Miracle Whip instead of mayonnaise) or an alternate date for delivery when the Prime Vendor anticipates the requested item will be in stock. At this stage, the LSR will again contact the ship, provide it with the two options, and confirm what its requirements are.

#### E. Finalization of Order

When finalizing the order, the LSR relays the ship's request to the Prime Vendor, who then finalizes the order and confirms a delivery date and time. This delivery date is usually within 48 hours of receipt of the order. The LSR then contacts the ship, confirms the delivery date, and provides them with a finalized order.

The last function that the LSR performs is to schedule a conveyor and a contracted working party (if necessary) to assist in loading the provisions onto the ship on the day of delivery. Naval Supply Systems Command in 2002 implemented the subsistence onload program, which provides a team of contract stevedores to load provisions for the ships. Prior to this program, provision onloads were conducted by working parties composed of Sailors, and it was not uncommon for Sailors to have to put aside more important duties to perform this mundane task. As a result of this program, Sailors have more time to pursue official duties—such as maintaining weaponry or radar systems—thereby improving the combat capability of their ships. Also in 2002, Naval Supply Systems Command purchased 14 conveyors, modified specifically for pier-side use. The conveyor extends from the pier to the ship's deck and serves to reduce loading time; it is also safer than the old method of passing boxes from hand to hand. Both the conveyor and the working



party represent a significant improvement in the quality of life for our Sailors afloat. The LSR determines whether the ships are eligible to have a contracted working party assigned to perform the onload, based on the size of the order. This eligibility is determined by the number of pallets of food ordered for delivery (see Table 1)

**Table 1. Working Party Requirements by Ship Class**

<b>Ship Type</b>	<b># of Pallets</b>	<b>Size of Working Party</b>
SSN	3	15
FFG	3	15
DD	3	15
DDG	3	15
AGF	6	15
LPD	6	15–20
LSD	6	15–20
ADE	10	15–20
LHA	10	20–25
LHD	10	20–25
CVN	20	20–25



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## VI. Order Process Recommendation

### A. Recommendations for the Order Process

As discussed previously, the ordering process and inventory records-keeping functions are time-consuming, manpower-intensive and critical processes performed on every Navy ship on a daily basis. Ensuring that each ship is adequately provisioned is a critical step necessary to ensure that each ship is operationally available to support national security interests globally. To reduce manpower requirements afloat, improve inventory management, and reduce the administrative requirements associated with inventory, we recommend that the Navy move its records-keeping functions ashore. This is the best possible solution to reduce the workload of our already overburdened CSs, improve inventory management, and provide both transparency and visibility of inventory levels to decision makers. We also recommend utilizing a commercially accepted business practice similar to that of vendor-managed inventory.

### B. Records Keeper Ashore

The idea of moving records keeping of foods ashore is by no means a new concept. As far back as 1998, Naval Supply Systems Command was conducting research on this very topic. In an article for the *Navy Supply Newsletter* (1998, May/June) entitled *Navy Food Service: Trying to Make a Hard Job a Little Easier*, CDR Frank Lindell, Director of the Navy Food Service, wrote,

We are also partnering with the fleet to shape the afloat food service operations of the future. As part of the fleet's Afloat Supply Department of the Future (ASDOF) Team we have identified several opportunities to reduce workload afloat ... moving record keeping off ship, eliminating private mess accounting, improving stateroom management, shifting inventory management to other ratings, and outsourcing FSAs while in port. Though these proposals are in the developmental stages, they appear very promising. Food Service is also being addressed as we develop our SUP 21 vision ... striving to institutionalize technological and business practice changes that will minimize the food service footprint afloat and reduce workload to meet the



reduced manning levels. As the Navy's program manager for Food Service, NAVSUP's objective is to optimize the use of commercial business practices wherever the application is most practical. Our efforts will continue to stay focused on the procurement of nutritious and high quality food products, insertion of advance food technologies, and installation of labor saving equipment and the professional growth of our MSs. The well being of our Sailors is of paramount concern. [...] Quality of life is vital to maintaining readiness well into the 21st century.

Based on this article, it is clear that the Navy has recognized the potential gains that can be realized by moving the records-keeping function off the ship, yet though some 12 years have passed since CDR Lindell wrote the above article, we are no closer to accomplishing this goal. It is also interesting to note that of CDR Lindell's six recommendations, only two have been accomplished to date (eliminating private mess accounting and improving stateroom management). We contend that with today's technology, the potential exists to move the records-keeping function ashore and that NAVSUP should move forward with this initiative now rather than later.

We contend that 12 years ago, the factor that prevented this initiative from becoming a reality was related to the limited and unreliable communications capabilities that ships experienced. At that time, any time a ship went to sea, it had extremely limited and unreliable communication connectivity with shore facilities, and in order for a Records Keeper ashore to effectively manage the inventory of a deployed unit and to receive the required information to post in the FSM system, it must be able to communicate with that unit on a regular basis. We contend that the lack of effective and reliable communications prevented this initiative from becoming a reality. Today, however, with the vast improvement in connectivity, this barrier has been overcome. Ships underway now have excellent connectivity on both secure and unsecure Internet networks, and the Navy continues to make significant improvements in this field. Rarely, with the exception of submarines, do ships lose Internet connectivity for any period of time, let alone for extended periods of time (i.e., 24 hours). While our recommendation hinges on the ability of the ship to transmit the required information to the ashore Records Keeper via the Internet, we



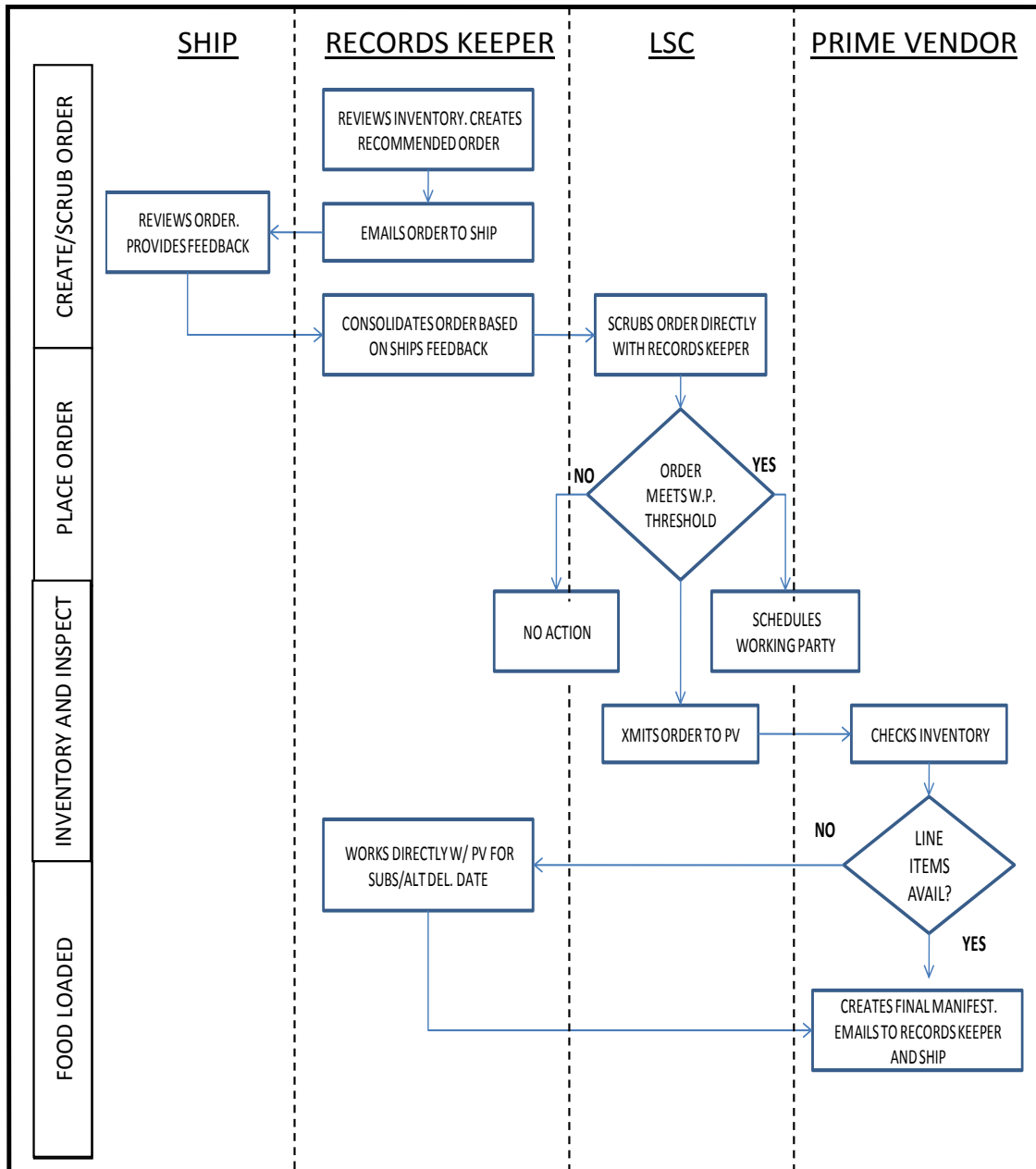
contend that the ship could easily relay the information via other communications paths (i.e., telephone and message traffic) in the event that the ship experiences problems with its ability to access the Internet. This is a key factor since it is almost unheard of that a ship will lose all communication paths (i.e., telephone, message traffic, etc.) simultaneously. The Navy has made significant improvements with regard to connectivity and access to the International Maritime Satellite (INMARSAT) phone system, providing ships underway with extremely reliable phone access. Based on the technological advances in the field of communications, the argument that ships will not be able to provide the required information back to the shore is no longer a valid one.

During recent discussions with NAVSUP on the topic of moving records keeping ashore, we noticed that NAVSUP is apparently waiting for an IT solution to replace an outdated Food Service Management system (FSM), prior to making this move. In discussions with the current Director of Food Service, NAVSUP has stated that it was its hope that this new IT solution will promulgate the shift of moving records-keeping functions from afloat to ashore. The authors of this report question the decision to wait. From personal experience, we can state unequivocally that NAVSUP has been working for ten years to replace the antiquated FSM system currently in use. Regardless of NAVSUP's repeated attempts to find a suitable IT solution to replace FSM, it has nothing to show but updated versions of the old system. It is our contention that instead of waiting for an IT solution, a solution that is currently nowhere on the horizon, we simply move the current FSM system ashore, and establish a detachment of records keepers to handle this function. Establishing a shore detachment to perform tasks previously performed onboard ships is in no way a new concept for the Navy. In 2002, the Navy established the Pay and Personnel Detachment (PAPADET), whereby all pay and personnel administration functions, those traditionally performed by either the Disbursing Division or by the Administrative Division onboard ships, were moved ashore. As a result of this initiative, all pay and personnel related billets (Disbursing Clerks and other personnel) were removed from the ships and re-assigned to this shore detachment.



Since this move was made, this shore detachment has performed, with tremendous success, all pay and administrative-related tasks for all Sailors attached to a ship, our recommendation would be to establish a mirror-like image of the “PAPADET” using Culinary Specialists to maintain food service records ashore. Furthermore, we would recommend that this detachment be co-located with the Subsistence Logistics Support Representatives currently stationed at the Fleet and Industrial Supply Centers around the world. This would provide the Culinary Specialists performing these records-keeping functions with direct access to those personnel necessary to perform many of their daily functions. Co-locating all personnel involved with the ordering process would serve to significantly streamline this process. Figure 4 demonstrates the considerable amount of communication between the ship, shore, and Prime Vendor, which results in a cumbersome and time-consuming ordering process. We recommend that if the Records Keeper were moved into a room directly next door to the Prime Vendor and the Subsistence Logistics Support Representative that processes the order, everyone involved in the business process is then in the same physical location. Under these conditions, there is significant potential to reduce the requirements of contacting the ship (see Figure 5).





**Figure 5. Records Keeper Ashore**

In comparison to the current ordering process, our recommendation significantly reduces communication requirements placed on the ship and considerably increases coordination ashore. This process allows direct interpersonal communication, significantly reducing the time it will take to place the order as well as reducing the potential for mistakes. In this process, the ship provides input at only



critical points in the process, leaving the shore facility to coordinate the less consequential aspects of the order.

In addition to placing orders on behalf of the ship, the ashore Records Keeper would also be responsible for monitoring the inventory levels in FSM, thus providing an additional layer of support to each ship. Since the ashore Records Keeper will be maintaining all records, giving him/her access to real-time inventory levels, it is only logical to note that this individual would be in a good place to generate orders on behalf of this ship. Based on the 21-day Cycle Menu and current inventory levels of each unit, the ashore Records Keeper would now have the ability to accurately and effectively determine requirements. The Records Keeper only needs to look at the meals the ship will be serving in the coming weeks, compare the ingredients for each meal to current inventory, and maintain all the necessary information to generate a recommended order. At this stage, the ship's only requirement would be to receive this recommended order from the ashore Records Keeper, visually inspect its inventory, and submit changes as necessary. It is important that the ship remain in the "ordering loop" for several reasons: the first and most important is to deal with "buy-in" from the ships. Change is always difficult, and in this instance there would be little chance of gaining this buy-in without providing the ships with a certain degree of control over their destiny. In addition to promoting buy-in, having the ships provide input is necessary since, while underway, they have direct access to the inventory while the Records Keeper does not. While underway, the Records Keeper is basing orders on a paper inventory. The ship, on the other hand, can visually site inventory and, as a result, provides valuable information that the Records Keeper cannot access. This visual access provides a solid quality-control check in the process as well as giving the ship some degree of control. The process would be an easy one—the ship's Leading Culinary Specialist would receive and print out the recommended order sent via email by the ashore Records Keeper, review the contents, and then take that order down into his or her storerooms to validate the requirement. This process provides LCS an opportunity to verify what is actually in the ship's inventory and compare that inventory to the quantities being



ordered. This is important since there are times when the ship is required to dispose of inventory due to spoilage or damage. If the ship fails to report this disposal to the ashore Records Keeper in a timely manner, the actual inventory will be different from the one carried by the ashore Records Keeper. Additionally, the CS will be able to review the order, and compare it to how much space it will potentially take up in his/her storerooms. Space is an extremely important consideration when orders are placed, since there is only a finite amount of space available for the inventory. If an order is placed that is too big, and the ship can't find the room to store it, then there is a possibility that they could be placed in a position of having to dispose of it, either by giving it away or throwing it out. Having the ability to visually inspect space requirements is absolutely essential in the ordering process.

Additionally, an environment will be established where Records Keepers are assigned to a billet where their sole function is to perform records-keeping tasks. This will ensure that Records Keepers ashore are well versed in what they do. The current shipboard Records Keepers are usually young Sailors, often directly reporting from the Navy's Culinary "A" school (the Navy's initial culinary school), and as a result they lack the experience to properly perform these functions. By moving this function to a shore detachment and requiring that all personnel receiving orders to this detachment have at least four years of sea-duty, we will now have a seasoned First- or Second-Class Petty Officer (E5/E6) with real shipboard experience looking at the inventories and using that knowledge to determine what the next size order should be for the ship. The Leading Culinary Specialist on the ship will make any suggestions or recommendations, since they are performing the "break-outs" and "break-backs." Since they actually expend the food, they will have the opportunity to provide direct feedback to the ashore Records Keeper, noting any trends they may be experiencing (i.e., that they are expending more of one particular type of item, such as milk, eggs, etc.). For ships that are deployed, this method would also give the Records Keepers ashore an opportunity to monitor the inventory so they can see a drawdown in any of the particular staples that the ship is going through. For example, the Records Keeper ashore can look and see if a ship is



going through more eggs than other class ships of the same size. At this stage, the Records Keeper can send an e-mail to the LCS on the ship and inform him/her that, based on their schedule for the next port or for their next replenishment at sea with an MLS ship, perhaps they should curtail their use of eggs and go into a more conservative mode. In addition to this method, we suggest moving to a “push” vice “pull” system, wherein the Records Keeper ashore is pushing material with input from the ship. At this stage, the only thing the LCS has to do is physically look and see what the inventory levels of the ship are currently at, make small recommendations, and push the information back. Now the Records Keeper can speak directly with the Subsistence Logistics Representative ashore or to the Prime Vendor (both of whom will be in close physical proximity to each other), and together they can generate the required order with two sets of eyes looking both at quantity orders and unit of issue. This method will provide for an additional layer of coverage in this area, serve to reduce discrepancies, and significantly prevent the chance that a ship will receive nine cases of an item vice nine individual items.

In discussions with both FISC and NAVSUP, there was considerable concern with regard to units receiving provisioning support in foreign ports, especially since the ashore Records Keepers are physically located back at the ship’s homeport. We argue that a Records Keeper ashore, located in the FISC, would have tremendous knowledge of 1) the ship’s schedule, 2) the availability of different food items at foreign ports, and 3) the availability of food items onboard Military Sealift Command (MSC) replenishment ships for ships receiving provisions from an underway replenishment. These three factors provide the ashore Records Keeper greater overall awareness of available resources, and far greater insight when scheduling food deliveries for the ship. Additionally, it is common that when a ship first deploys overseas, the Records Keeper has never done so and so has no experience with regard to dealing with foreign vendors, or with scheduling at-sea replenishments with an MSC ship. By using a detachment of ashore Records Keepers, this would never be the case, since those personnel will have experience in dealing with either



situation or will have access to other personnel in the detachment who will provide information on how to conduct those transactions.

By establishing an ashore Records Keeper, most of the functions traditionally performed by the ship will be moved ashore. By doing so, many of the tedious and time-consuming functions traditionally performed by the Food Service Officer, the Leading Culinary Specialists, the Records Keeper, and the Supply Officer, will be moved ashore, freeing up those personnel to perform other tasks while underway—mainly feeding the crew.

Since the ashore Records Keeper knows the ship's schedule, its current inventory levels, and what is currently available from either the Prime Vendor or MSC ship in the event of an underway replenishment, he/she can anticipate orders and provide to the ship a list of substitutions in the event that particular food items are unavailable. Prior to placing any final order, the ashore Records Keeper provides the ship with an opportunity to provide input for either additional items or a say with regard to substitutions. Providing the ship with the opportunity to either accept or reject substitutions also gives the ship advance knowledge with regard to the availability of certain food items. This knowledge is important since it lets the ship know what changes could be required to the standard 21-day Cycle Menu the Navy is currently utilizing and how meals served on certain days may be affected. This gives the Supply Department on the ship enough time to advertise to the ship's crew how many meals scheduled for the following week will be changed. Once the ship is underway, routines are tremendously important, and any interruption of these routings often causes an adverse reaction and may significantly affect the morale onboard the ship. When it comes to morale, food is the number one driver onboard deployed units. If the ship knew in advance that an anticipated meal could not be prepared as a result of missing ingredients, this fact could be advertised early and the ship would be prepared. From personal experience on a previous tour as the Supply Officer onboard a deployed ship, one of the researchers learned that a change to a particularly popular meal can adversely affect morale. Onboard this



particular ship, every Friday the Food Service Division served pizza for dinner, so the evening meal was affectionately called Pizza Night. The ship's crew, well aware of this fact, eagerly anticipated Fridays, since pizza was one of the meals the crew enjoyed the most. On one particular Thursday, the ship was scheduled to receive provisions from an MSC ship via an underway replenishment, and included in that particular order was flour, which was to be used to make the crust for the pizzas for Friday's meal. Unfortunately, the MSC ship did not have any flour in its inventory, and as a result there was not enough flour to make the crusts for the pizzas the following day. Consequently, an alternate meal was served, and the crew, including the Commanding Officer of the ship, was extremely disappointed. Had there been an advance notice of the impending shortage, this particular situation could easily have been avoided. This is where a seasoned ashore Records Keeper could have been extremely useful.

By providing a "push" vice "pull" method, and moving our records keepers ashore, additional shore billets would be created for Culinary Specialists. Currently our Culinary Specialists are on what the Navy calls a 5-2 Sea-to-shore rotation. This rotation requires our Culinary Specialists to spend five years stationed on a ship, followed by two years ashore. Currently the majority of these billets are located at shore galleys. By creating these ashore Records Keeping billets, and locating them in the Fleet and Industrial Support Centers, the Culinary Specialists assigned to these billets will be co-located with both the Navy Food Management Team and the Logistics Support Center, providing them with a tremendous opportunity for career enhancement, as well as the opportunity for professional development. Additionally, since these sailors would be assigned the sole task of performing records keeper functions for multiple ships, they would have the opportunity to experience a variety of problems, which again would serve to aid in training and provide the best possible quality Records Keeper. Currently, the Records Keepers afloat split their time between performing their daily cooking duties and their records keeping duties. Often they are only assigned as the Records Keeper for six to ten months before another sailor is rotated into the position. Training a new Records Keeper can take



weeks, and often the ship will experience “growing pains” in the form of mistakes while this new Records Keeper becomes proficient. However, by creating this detachment, the CSs will serve for a prolonged period of time (two to three years), and will work four to five ships, as opposed to just one.

Perhaps one of the most beneficial aspects of all of this is that the CS is now co-located with both the Navy Food Management Team and the Afloat Training Groups. These two organizations are staffed with recognized Subject Matter Experts (SMEs) in food service that would provide these Culinary Specialists with the opportunity to develop working relationships with the best the Navy has to offer in this field. Additionally, the sailors assigned to this detachment will have a pool of Subject Matter Experts that could be called on to help guide them with regards to career development, as well as to assist them with performing their duties as the ashore Records Keeper. As a result, if an error is made, it can be corrected on the spot since the knowledge base required to make the correction is literally in the next room. This will help to improve inventory management, prevent ordering errors, and provide a valuable resource to assist in correcting the most complex problems as they occur.

Moving records keeping ashore will also reduce an enormous amount of administrative paperwork that is required to be produced, reported, and maintained onboard each ship. It is recommended that all of this paperwork be produced, reported, maintained, and inspected ashore.

### C. Technology Support

One of the most significant problems that the ships are experiencing using the antiquated FSM system is the fact that it is an extremely unreliable system. FSM has a tendency to crash, and often, as a result, all resident data is lost. This loss of data will often require the ship to manually re-enter days', sometimes weeks' worth of lost information. The process of manually re-entering data is tedious and time consuming. Additionally, since the Records Keeper has to re-enter this lost data





prior to entering current data, he/she is often pressed for time. As such, the Records Keeper is forced to hurry and often makes mistakes that affect the validity of the recorded inventory residing in the FSM System.

Currently, Naval Supply Systems Command requires ships to perform back-ups for this system on a periodic basis, in the form of *day-backs*. These back-up files are saved at the end of each day, every Friday (saving the entire week's worth of data), and again once a month. Naval Supply Systems Command's requirement for each ship to maintain an extensive database of history is proof positive of the tremendous unreliability of the FSM system. When a ship is underway and it experiences problems with FSM, it has only a minimum amount of organic IT support onboard. The problem lies in the fact that since the software is so old, most of the IT specialists onboard—those charged with providing support for state-of-the-art weapons systems—have never worked with FSM before and are of little help. This lack of experience with FSM will often require the ship either to rebuild weeks' worth of data, or to cause them to wait until it can return to port and get help from trained FSM IT specialists. Placing the Records Keeper ashore directly across the hall from IT support would be akin to providing each ship with a dedicated IT Support team solely for FSM issues.

#### D. Vendor Managed Inventory

Push versus Pull, as discussed earlier, falls very much along the lines of vendor-managed inventory. Currently, Wal-Mart has provided its suppliers access to its inventory. In doing so, Wal-Mart has taken itself completely out of the game of re-orders. What simply happens now with vendor-managed inventory is that Proctor & Gamble, for example, will recognize that shelves of Tide are running low at a particular Wal-Mart. Based on the inventory levels that Proctor & Gamble is seeing (which is akin to the Records Keeper looking at the inventory levels based on reducing amounts of break-outs and break-backs that the ship experiences), it will automatically generate the order, run it through Wal-Mart, and ship the material. This business philosophy works perfectly in line with what we are recommending. The



ship in this case is Wal-Mart. The ship is generating meals, reducing its inventory and providing the break-out and break-back inventory levels that the Records Keeper is monitoring. As the inventory draws down, the Records Keeper, looking at the 21-day Cycle Menu, determines what the ship's requirements are for the following weeks. The Records Keeper ashore becomes like the vendor for Wal-Mart who has to replenish its stores' inventory. This method pushes the material, which will help with our over- and under-issues, which are a considerable problem on the ship. When a ship is over issue, it means the ship has issued more food than the required daily allowance it is given. When this happens, the ship gets in trouble and is required to request permission to be forgiven for the excess, or the ship must deviate from the 21-day Cycle Menu and serve meals that are inexpensive so that the over issue goes back to the required daily allowance. If a ship is under issue, it means they are not serving as much food as they are required to. They are usually forced to serve off the 21-day Cycle Menu once again and provide a more expensive meal, such as lobster, to bring their numbers back up to the required daily allowance. Either way, the Records Keeper is monitoring the ship's inventory and issue and then pushing the required food to satisfy the requirements to maintain the operational effectiveness of the ship. This practice also falls in line with the Records Keeper knowing what phase of the deployment schedule the ship is in (i.e., Is the ship preparing to deploy in the future or is the ship in an extended stand-down?). If the ship is in an extended stand-down mode, there are no requirements to have a 100% provision on board. Any ship that does have a 100% inventory on board is simply a waste of money and valuable naval resources. We have tied up resources on a ship that is going to remain pier side, whereas a ship that is deploying could better utilize these resources. The Records Keeper ashore would allow us to monitor our inventory and have the right inventory at the right time for each ship. This will prevent any over- or under-issue from ever occurring.





## E. Conclusion

As stated at the beginning of this chapter, inventory management of provisions onboard today's Navy ships is an extremely vital function. This function, however, is a difficult and time-consuming task that burdens our Culinary Specialists afloat and reduces their availability to perform their primary mission—that of feeding the crews of those ships. By moving the current records keeping functions ashore, we would be freeing up those Culinary Specialists to perform this function and subsequently improve the quality of life for our sailors.

We contend that with improved communication connectivity on ships underway, coupled with the predictability of the Navy's 21-day Menu Cycle, the environment exists now to move these records-keeping functions ashore. We argue that waiting for the development and implementation of a new IT solution—one that would replace the antiquated FSM System currently being utilized onboard ships across the fleet—prior to taking this initiative is unnecessary, and that the Naval Supply Systems Command should make this move now vice later. As we have discussed throughout this chapter, such a move would reduce the administrative burden, improve the current ordering process, and provide additional layers for inventory management, as well as provide decision makers with a single point of contact for real-time information on the food inventories of all ships under their command.

Lastly, while we concur that the Navy must seek an IT solution to replace the antiquated FSM System, we question the decision to wait for this new software prior to moving the records-keeping function ashore. This challenge has to do with that of change. If we are to wait for this solution—one that is not even in development yet—then both implement a new software package and move the records-keeping functions ashore simultaneously, we would be expecting our Sailors afloat to adapt to two significant changes at the same time. By moving FSM ashore now, and developing a detachment of ashore Records Keepers to handle the administrative and financial requirements of all deployable units, by the time the new IT solution is



ready for implementation, ships would already be comfortable with the process of dealing with an ashore Records Keeper. In addition, we contend that moving the records-keeping function ashore well prior to implementation of any new IT solution will give the new software package a significantly greater chance of success. If the records-keeping functions were moved ashore now, then, when the new IT system is ready for implementation, the only issues would be related to hardware/software and the training of personnel as necessary.



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## VII. Recommendations for the Receipt Process

### A. Introduction to Recommendations

Currently, the receipt process is an extremely cumbersome and time-consuming process. There are numerous areas where efficiencies can be gained in terms of saving costs and time through more efficient processes.

As outlined in the main body of the section on the receipt process, the first time that the crewmembers onboard the ship really get involved in the process is when the driver offloads the food at the pier and then positions it in the staging area. From there, crewmembers have to cut off the shrink wrap from the pallets of food, receive the manifest from the truck driver, and then count each individual line item to ensure 100% accuracy. For pallets that are not mixed with different food items, this is not a difficult task to perform. However, if a ship orders two cases of corn, the Prime Vendor is not going to put just two cases on one pallet. This would be a significant waste of time and space for the Prime Vendor and would not be a feasible request to impose. During our research, there was one pallet of food that had nine different line items. This variety makes it difficult for the ship's designated person responsible for doing the count to go through the manifest and visually sight every single line item. This seems to be our "long pole in the tent" and is by far the most time consuming of all of the processes. As our research indicated, it took just as long for the Records Keeper, or ship's representative in charge of conducting the inventory count, to confirm the manifest's accuracy as it did for the stevedores to load the entire order onto the ship and store the goods in their respective holding areas. Looking at this problem, we came up with two potential recommendations.

### B. Recommendation #1

The first recommendation is that the Naval Supply Systems Command employs what we call a "consolidator." This consolidator would be employed by



either FISC at Naval Supply Systems Command or potentially from an outside source that we could contract for. He/she would be responsible to go to the warehouse and be our representative to ensure that the counts of the food items are accurate. As the Prime Vendor is loading the food items onto the pallet, it is much easier for the consolidator to do the count of line items as they are placed one by one on the pallet vice our sailors counting them when they are fully loaded on the pier.

From talking to representatives at US Foods, we understand that they have a team of three personnel that are solely responsible to maintain the 98% accuracy rate as required by the contract. If we had just a single person that we could physically put in the warehouse and get a second set of eyes counting the items, then all we would need them to do is initial the manifest, stating that the requesting line items are 100% accounted for in the pallet, have the pallet shrink-wrapped, and then have it loaded onto the truck. To add an additional security measure to the process, we could have the consolidator put a car seal on the truck once it is loaded, sight the car seal number on the manifest, and then sign the manifest. This would ensure that the food has not been tampered with from the time it leaves the warehouse until it arrives on the pier.

If a consolidator at the warehouse is included, a veterinarian should also be included. In addition, a medical representative from FISC could be included, since they have a certain number of medical representatives attached to them to run their medical reutilization program. The medical representative could also conduct a quality-control check on all of the food items while they are being loaded onto the pallets in the warehouse. This would allow two essential areas of the receipt process to be conducted at one time and also save time at the pier by not having to worry about counts and quality of food. No food items at the pier would be rejected, nor would additional food items be requested that might have been missed. This way, all of the discrepancies are caught during the loading process at the warehouse, which is the earliest stage of the receipt process. At this point, it is certain that 100%

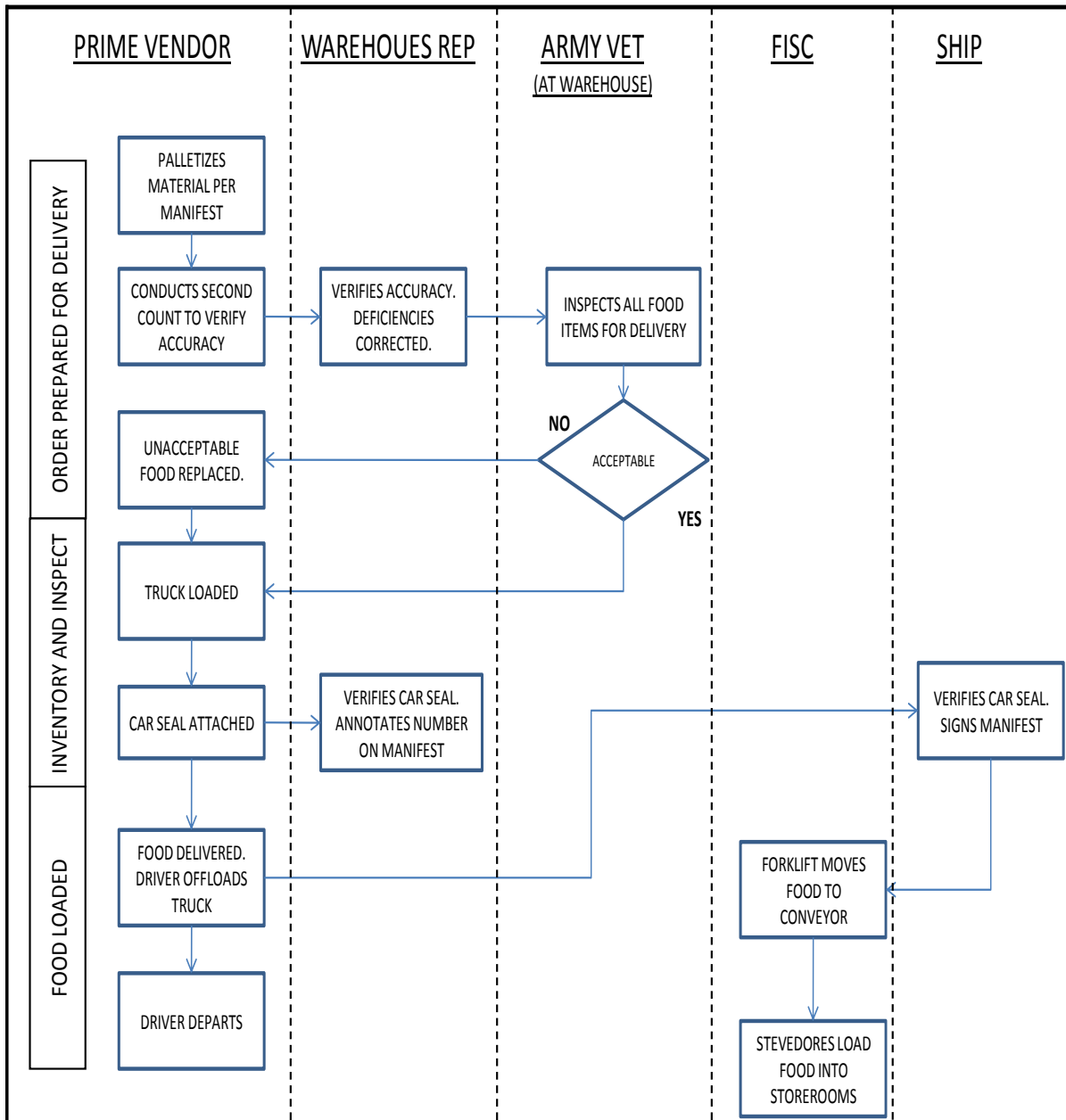


accuracy in the food count is being delivered, the containers are in the right shape, the food items being delivered are fresh, and the meat has been inspected by the veterinarian or medical representative to ensure it is USDA approved.

When the food arrives on the pier, only the following steps are required (see Figure 6):

- Truck driver offloads food.
- Ship representative signs for the food.
- Forklift stages food near conveyor.
- Stevedores load food into the appropriate holding area on the ship.





**Figure 6. Receipt Process Recommendation #1**

No longer do ship crews need to wait for a veterinarian to show up or take the medical representative off the ship to inspect the food (which is traditionally a time when sick call is being conducted). Also, the Jack of the Dust is no longer required to be on the pier possibly counting the food items. The Jack of the Dust can now be

in the food-holding spaces as the food is being brought down by the stevedores, and he/she can direct the stevedores to place the food so as to ensure proper storage.

Based on the research of the five ships inspected, this method reduces by 50% the entire receipt process time by employing the following changes:

- Stevedores are no longer sitting on the pier waiting for the counts to be conducted. They can immediately begin loading the food once the delivery truck offloads the pallets.
- Prime Vendor delivery truck can leave immediately after dropping off the food. No longer do they have to waste valuable time watching the ship's representative conduct the 100% inventory check.
- The ship no longer needs a representative to conduct a 100% inventory count on the pier.
- A quality-of-food inspection is no longer required to be conducted on the pier.

Prior to this change, ships needed three to four representatives on the pier to oversee the receipt-process evolution. Now all that is necessary is one person to meet the driver on the pier to sign the manifest. All the truck driver needs to do is offload the food, and then he/she can drive away. This frees up the truck driver to respond to more ships throughout the day, delivering more goods than was previously possible.

Currently, we are force multiplying all of the critical positions needed to perform the receipt process by making every ship have the required personnel to conduct the receipt and perform the quality check and stowage of ordered food. If 10 ships on the waterfront had a scheduled delivery of food for that day, then 10 medical representatives would be required in addition to the 10 ship representatives to conduct the 100% inventory count. Why do this when you can have two people in the Prime Vendor warehouse taking care of this task before the food even leaves the warehouse? This is a win-win situation for both the Navy and US Foods because each side is saving money and time. Additionally, if we put our medical representatives into the Prime Vendor's warehouses, then we gain the advantage of





having our medical representatives putting their eyes on the storage locations where the food is coming from. We would then have a professional who is continuously searching for any hazardous or potentially unsafe food items directly at the source. What a better motivator for US Foods to sustain a safe storage location for our food than to have one of our medical representatives working daily out of their warehouse.

This motivational factor for the Prime Vendor can be applied to the consolidator at the warehouse as well. US Foods already maintains a 98% or higher accuracy rate on assuring that the food quantities delivered match the requested amount asked for in the ship's order. Having the consolidator in the warehouse would only improve this process, ensuring an even higher accuracy rate.

Currently, if an order of milk is turned away on the pier due to a past-expiration date, valuable time and money have been lost in the process. Reviewing the process from the start: the milk was counted at the warehouse, loaded on a truck, delivered to the pier, offloaded from the truck, and then brought to the staging area. Not until this late stage of the process are we discovering that there is an issue with the milk. This entire process has to be reversed until the truck driver gets back to the warehouse and replaces the expired milk and then begin the process all over again. Ships that are getting underway that day may not have the luxury of time on their side to wait for the milk to be delivered again at a later date. If the veterinarian were at the warehouse before the milk was delivered, these issues would not have happened. All of these processes would have been handled up front.

This process would be very similar to vendor management inventory with regard to quality control. Someone would have been providing the best level of quality control possible at the earliest possible time in the process. If just a few of the critical processes were completed at the warehouse, then each platform would have a very stable timeframe within which the receipt process would take place. The ship would be able to schedule plans accordingly so that there would be no wasted time during the day. Since there would be fewer people on the pier now, the Culinary



Specialists could be down in their spaces in the galley performing their regular job responsibilities, like cleaning up from breakfast and starting the preparations for the lunch meal.

The only down side to this recommendation, is that there is a very small amount of capital needed to hire outside contractors to perform the consolidator's job. The position could also be billeted to another military person who might be cheaper than an outside contractor. Either way, the cost is minimal compared to the money that we are spending to complete this process now.

There is a new ordering system being introduced, wherein the ships will be ordering directly from the Prime Vendor. This change will remove or alleviate a tremendous amount of responsibility from the Logistics Subsistence Coordinator (LSC). With these people now freed up, there is no reason that one of them can't be the newly assigned consolidator. The government is already budgeting to pay the LSCs, so it would not be an additional expense to the budget. Also, who better to be the coordinator at the warehouse than the person who used to verify that the food orders were placed correctly in the first place? The LSC knows the typical order sizes for the different classes of ships. While conducting the count at the warehouse, the LSC might notice that 70 cases of hot sauce are being loaded onto a pallet for a Frigate. The LSC would instantly know that this is an incorrect order and that the most likely order was for 70 individual bottles of hot sauce. There would now be someone who could do a sanity check on the order, and who could stop the process early before it gets delivered to the ship. Normally this error would have been caught during the ordering process, but with the consolidator in the warehouse, there would now be added another level of quality control and inventory management to the process. At the end of the day, all of this additional help will add up to substantially greater inventory validity and accuracy as well as a significant reduction in manpower and money being paid for contracted working parties.

This proposed change would help with the quality of life for the Sailors as well. Instead of the Sailors sitting at the end of the pier wondering what is going on in

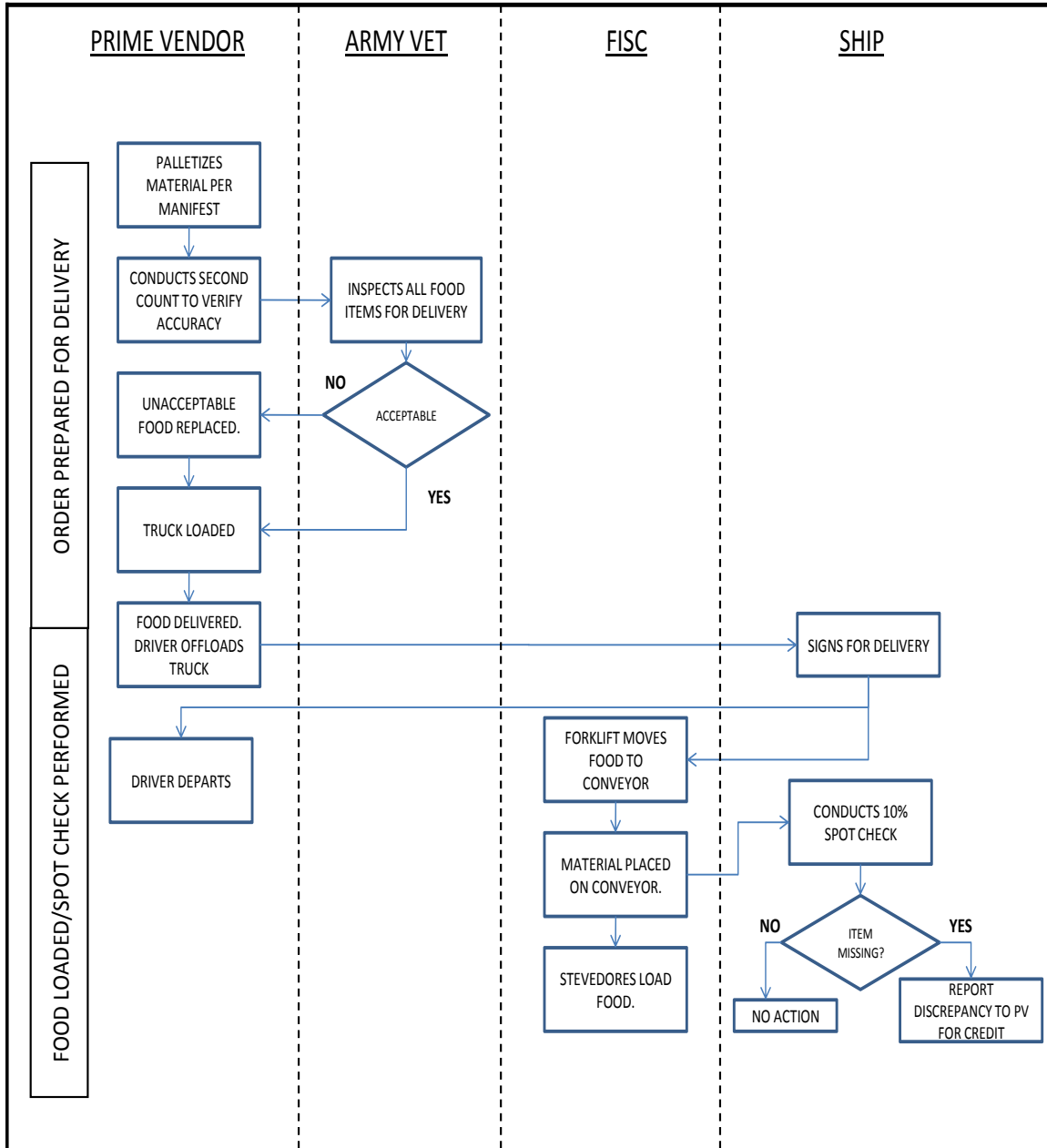


their spaces as they wait for the counting and inspection of the food, they can now be in their spaces being productive. No longer is a First Class, an Officer, a Records Keeper, or a medical representative required to count and inspect the food. Instead, only one E-2 goes out to the pier, looks for the initial from the consolidator and veterinarian, signs the manifest, and then allows the stevedores to start loading the goods onto the ship.

### C. Recommendation #2: Spot Checks

This process would be very similar to the initial recommendation, with the exception of the consolidator at the warehouse (see Figure 7). While conducting the research with US Foods, we learned that they could only recall two instances in the last year when their counts did not match what was given to the ships. In each case, the amount given exceeded what was requested from the ship, so it did not hinder the mission. Our recommendation is that all US Foods deliveries are accepted as delivered, since their overall accuracy rate is extremely high. We further recommend that a 10% spot check of the items be conducted as they are being sent on the conveyor (as detailed in Figure 7).





**Figure 7. Receipt Process Recommendation #2**

Working in the recommended manner, the truck driver can still leave after dropping off the food, and the loading of the stores onto the ship can still begin immediately. If an error is found, then we would report the discrepancy to the Prime Vendor for credit. In addition to doing the 10% inventory spot check of stores, we would also concentrate that spot check to include the high dollar-value items as well



as the very critical items. We would continue to do 100% inventory checks on lobster, crab legs, beef tenderloin, etc., which are our high dollar value items. The highly critical items would consist of coffee, milk, eggs, and flour—which are the items a ship never wants to run out of because they are staples to many of the basic main meals. Coffee and milk are huge morale boosters for the crew and should never be left out of the essential food items.

#### D. Conclusion

We suggest these two recommendations as areas that allow for the most efficiency. Recommendation #1 would provide an even greater degree of accuracy in the inventory; however, if capital were an issue, then recommendation #2 would be just as suitable. The percentage of accuracy in all US Food's deliveries is so great that the time spent by our sailors counting it again for 100% accuracy is wasteful and expensive.



## List of References

Lindell, F. (1998, May/June). Navy food service: Trying to make a hard job a little easier. *Navy Supply Corps Newsletter*. Retrieved May 2, 2010, from <http://www.seabeecook.com/today/news/cook0062.htm/>

Lyden, M.J. (2010). *Executing Navy's maritime strategy: Commander's guidance 2010*. Retrieved May 2, 2010, from <http://www.navsup.navy.mil/site/commandersguidance/2010/commandersguidance2010.pdf/>

Naval Supply Systems Command, United States Navy. (2004). *Food service management general messes*, NAVSUP Publication P-486. Retrieved May 2, 2010, from [http://www.usmc.mil/news/publications/Documents/NAVSUP%20P-486\\_PART\\_1.pdf](http://www.usmc.mil/news/publications/Documents/NAVSUP%20P-486_PART_1.pdf)



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